

# The Metal Worker

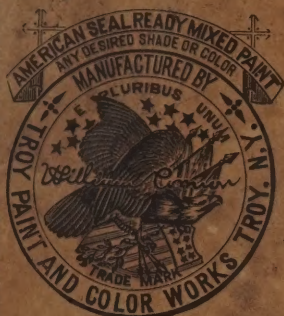
ROOFING, A WEEKLY JOURNAL OF THE STOVE, CORNICE, TIN, PLUMBING AND HEATING TRADES.

With which is incorporated The Stove and Tin Trade Journal, the Sheet Metal Builder, and Metal.

VOL. L.  
NUMBER 26.

NEW YORK AND CHICAGO, DECEMBER 24, 1898.

ONE DOLLAR A YEAR  
SINGLE COPIES 5 CENTS.



## Do

You want to contract for your wants in 1899 of... **AMERICAN SEAL** Stove Putty and Asbestos Furnace Cement? Prices may be higher next year, so get in on the ground floor.

**WILLIAM CONNORS, Troy, N. Y.**

## The "Gorton Side-Feed" Boilers

WILL BURN HARD OR SOFT COAL.

You Want the Best. We Have It.

SEND FOR CATALOGUE AND INVESTIGATE FOR YOURSELF.

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187-203 Congress St., Boston. Old Colony Bldg., Van Buren and Dearborn Sts., Chicago.

**CENTURY RANGES AND PARLORS. YES!**

Up to date and a little ahead is our 20th Century Range, just out.

**CENTURY STOVE CO., Dighton, Mass.**

## EASTWOOD VALVE.

**EASTWOOD WIRE MFG. CO., - Belleville, N. J.**



## DEALER AND CUSTOMER

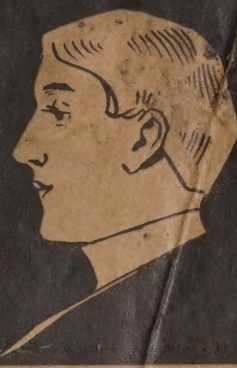
Join hands on the Paragon Furnace.

It is the link which binds them together and which keeps up the cordial relations between you and your customer.

The Paragon Furnace makes friends for you and keeps them.

**ISAAC A. SHEPPARD & COMPANY,**

New York. Philadelphia and Baltimore.



The genuine is stencilled "Apollo-Vandergrift"

**APOLLO BEST BLOOM GALVANIZED IRON.**

There are plenty of tricks in the galvanized-iron business. Ours is to make good iron. Nobody else has this particular trick.

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Pittsburgh**

## Steam Specialties.

Pump Governors, Noiseless Back Pressure Valves, Steam Traps, Water Arches, Reducing Valves, Oil Separators, Tank Temperature Controller, and A No. 1 Damper Regulators.

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## EXCELSIOR STRAIGHT-WAY BACK PRESSURE VALVE

This valve has no dash pots, springs, guides or complicated mechanism. It is simple, reliable and well made. It can be relied upon at all times when you exhaust steam for heating; or when used as a pressure check on a condensing plant, it has no equal. It is free from any complicated attachments.

**Excelsior Valve Works, New York, Philadelphia, Boston, Chicago.**

## Morgan Galvanized Range Boilers.

We are now prepared to furnish these superior boilers in 200 and 250 pounds strength at attractive prices. We solicit your inquiries.

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256 Water St., New Haven, Conn.

New York Store, 194 Front St.  
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## Sturtevant Blower System of Heating and Ventilation.

**B. F. STURTEVANT CO., CHICAGO. BOSTON. NEW YORK.**

## THE BEST REGISTERS ARE FERROSTEEL REGISTERS

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All working parts renewable without taking the valve from piping. All parts interchangeable. Guaranteed not to leak at high pressure. Send for circular.

**CROSBY STEAM GAGE & VALVE CO., - Boston, Mass.**

## OPPORTUNITY.

**"Grasp It."**

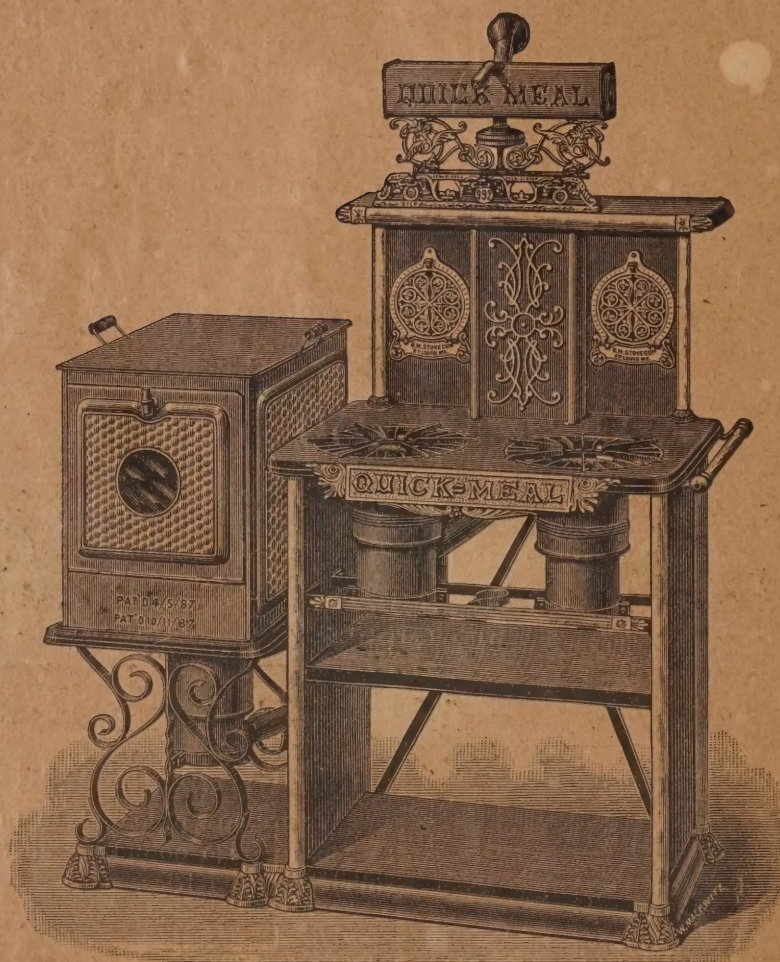
SEE THE **MAGEE "Ad."**

Page 8.



# QUICK MEAL

## GASOLINE STOVES.



The No. 992 "Quick Meal" Evaporating Stove will be the leader for 1899. It is prettier and better than ever. It is a fine looker, a fine seller and a fine satisfaction giver. The frame construction of the "Quick Meal" has met with universal favor because it is so far ahead of the old style skeleton frame construction. It is superior in strength and in beauty, and because it is so easy to keep clean on account of its smooth surfaces and the absence of nooks and corners to catch dust.

Quick Meal Steel Ranges are Quick Selling Ranges.

# RINGEN STOVE CO. SAINT LOUIS



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Main Office, UTICA, N. Y.

BRANCHES: { NEW YORK: 237 Water Street.  
CHICAGO: 86 East Lake Street.  
BOSTON: 198 Spruce Street, Chelsea, Mass.

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*Makers of the Old Reliable Established Heaters,*

**PALACE LINE,  
CARTON,  
KERNAN,  
PEASE  
ECONOMY,  
HOWARD.**

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*These Heaters Embody an Experience of over*

**50 YEARS.**

*Experience and Merit Combined.*

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Largest Makers of Warm Air Furnaces, Combination Warm Air, Steam  
and Water Heaters, Steam and Hot Water Heaters,

And Jobbers of Everything pertaining to the Heating and Ventilating  
Trade.

**EXPERIENCE and REPUTATION invite CONFIDENCE.**



TO all our friends and pa  
be our patrons, we wis

MERRY



CHRISTMAS

The Michigan

Largest Makers of Stoves

DETROIT,

CHI



trons, and those who should  
n a

HAPPY



NEW YEAR

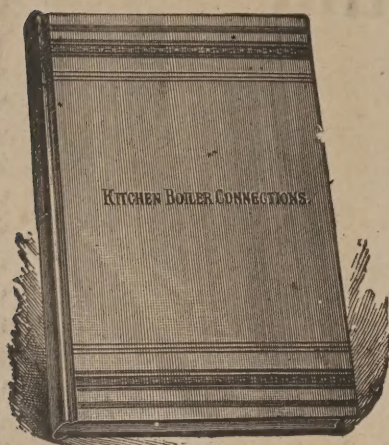
Stove Company,

and Ranges in the World,

AGO. BUFFALO.



# KITCHEN BOILER CONNECTIONS.



A SELECTION OF

Practical Letters and Articles  
Relating to Water Backs and  
Range Boilers.

Compiled from THE METAL WORKER.

71 Illustrations, 8vo, 140 Pages, Cloth  
Price, \$1.00.

The publisher of this work is well known for his former successful efforts in the publication of useful and thoroughly practical books for metal workers and steam fitters. The book before us is a model of its kind in judicious compilation, practical instruction, neat illustrations and general typographical appearance.—*The Master Steam Fitter.*

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Nearly every problem is illustrated fully and this interesting question of water back connections will be found to be quite fully treated in the volume.—*Domestic Engineering.*

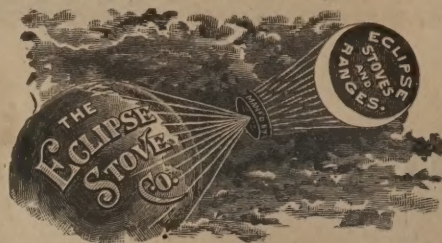
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## Steel Range

IN

TWO "SERIES," { "A" Medium Price.  
"B" Low "

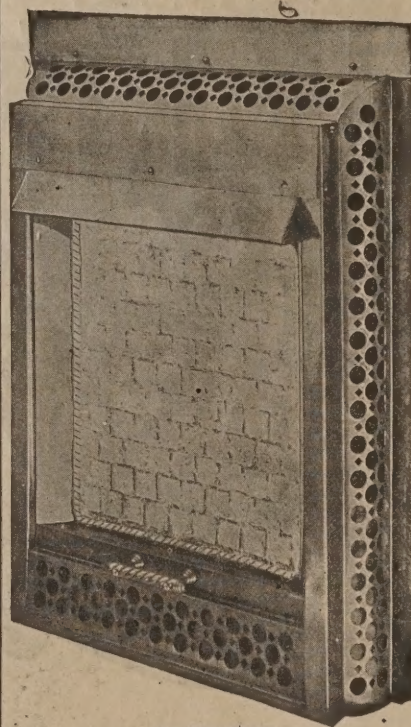
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ALL STYLES.

Write for Special Steel Range Catalogue No. 14.

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# How To Save Gas—Over 50,000 in Use.



PATENTED.

The Pittsburgh Gas Heater.

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FOR NATURAL OR  
ARTIFICIAL GAS.

MADE WITH EITHER BASE OR  
BACK BURNER.

Beware of Imitations.

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## Air-Tight

## Wood Stoves

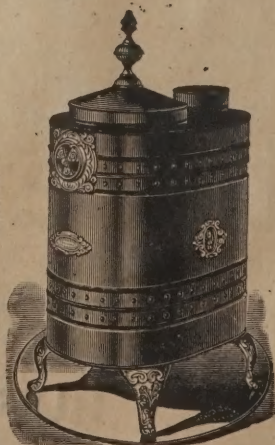
have special features of  
importance to both the  
dealer and consumer not  
to be found on any other  
make.

Write for  
descriptive  
circulars  
and prices  
before  
buying.



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TRILBY.



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AUTOMATIC

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DRAFT REGULATOR

Furnaces<sup>AND</sup> Boilers.

Consists of a  
Plate, Damper and Pulleys.

You should use it.

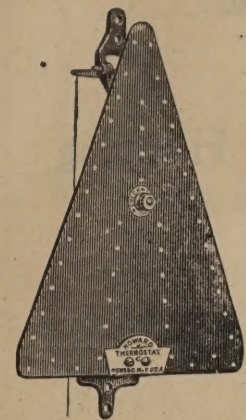
Why? It saves  
labor and worry  
about heater; gives  
nice heat; prevents  
danger from overheat,  
and

## SAVES COAL.

MADE BY

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OSWEGO, N. Y.



TO HEATER DRAFTS  
OVER PULLEYS.

The *Damper* is  
operated uniformly  
with the changes in  
temperature and not  
opened and closed  
suddenly. The move-  
ment and power is ob-  
tained directly from  
the *Plate*. From a  
normal position to  
wide open or closed,  
the change is but

ONE DEGREE.

PRICE IS POPULAR.

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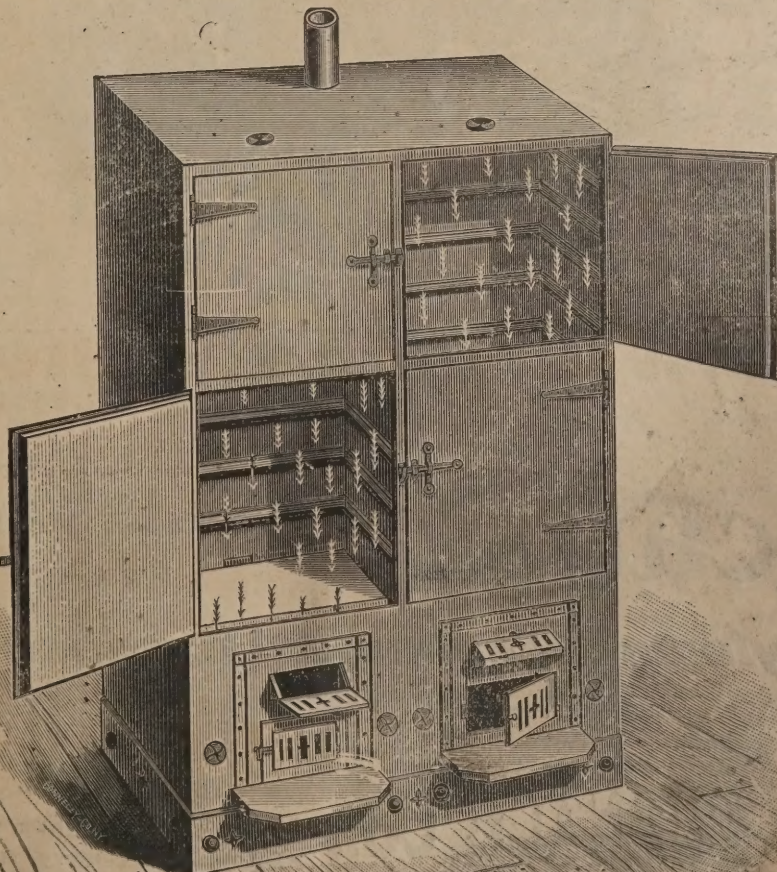
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Labor,  
Worry,  
Bad Heat,  
Danger,  
Coal.

## THE BLODGETT PORTABLE OVEN.

Still at the  
front although the  
war is practically  
over.

The War De-  
partment bought  
hundreds of these  
ovens where they  
are now in use in  
different camps.  
They were selected  
in preference to  
all others on ac-  
count of their  
superiority.



More Blodgett  
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made. This is  
why you should  
buy one, as they  
are thoroughly re-  
liable and fully  
guaranteed. As-  
bestos lined. Seven  
sizes single; two  
sizes double.

Send for circu-  
lar.

THE G. S. BLODGETT CO.,

Burlington, Vt.



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TO YOU AND YOURS.

*Call and See Us, and Feel at Home!*

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There is

## A Distinct

## Field

For the Dealer Handling



The Best  
FLAG.

The Best  
BIRD.

Copyrighted 1898, by the Magee Furnace Co. Boston, Mass.  
The Best Goods on Earth  
ARE THE  
**Magee**  
RANGES & HEATERS.

THEY ALWAYS RECEIVE HIGHEST AWARDS.

# Because

They Possess a Selling Quality

In addition to

***Style and Mechanical Excellence.***

Correspondence Solicited.

Send for Catalogue.

## MAGEE FURNACE CO.,

32-38 Union Street, Boston.

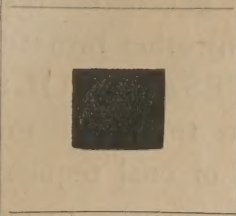
86 Lake Street, Chicago.

27 New Montgomery St., San Francisco.



## UNITED STATES WEATHER BUREAU.

Forecast at 8 a. m. for Twenty-four Hours.

**COLD  
WAVE.**

Generally fair; light  
variable winds, becom-  
ing northerly; fol-  
lowed by much colder  
weather.

**D**O you realize that Man's history has been one long warfare against cold?

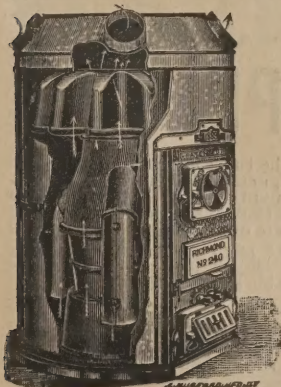
The struggle has begotten many of his cunningest inventions, from the clumsy suit of skins which served as his first coat-of-mail and the rude hut which was his first fortress, to the modern scientific Weather Bureau which acts as his spy upon the movements of the enemy.

One of the most ingenious war-engines of Man's invention is the Furnace—the first-class battleship, as it were, of his armament. Among furnaces there are none more efficient than those manufactured by The Boynton Furnace Co. Like an able man-of-war, they are powerful, economical and easily managed.

They are for sale by the best dealers all over the United States.

Our Catalogue will cost you nothing. Better send for it.

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# RICHMOND FURNACES.

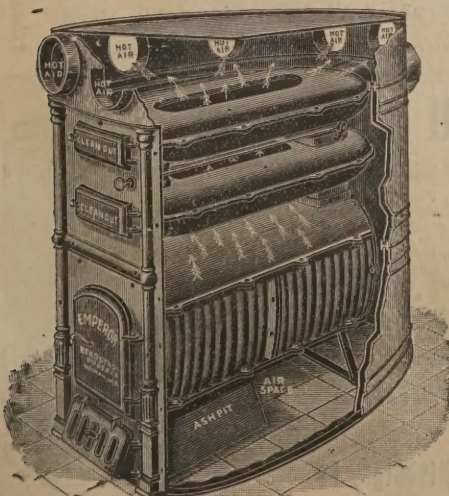
**10 STYLES. 47 SIZES.**

Write for Catalogue.

**THE RICHMOND STOVE COMPANY**

Norwich, Conn.

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85 CENTRE STREET.



## Emperor Furnaces

FOR WOOD.

Simple, Safe, Durable. Economical in Fuel.

The Best and Cheapest Line of Wood Furnaces...  
Furnished for either Brick or Galvanized Iron Casing.

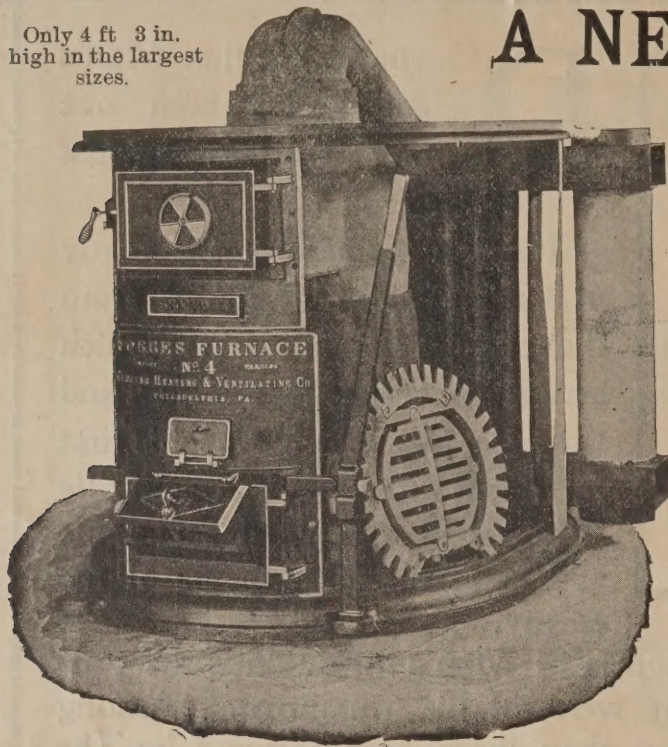
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*Boynton Bros & Co.*

NEENAH, WIS.



Only 4 ft 3 in.  
high in the largest  
sizes.



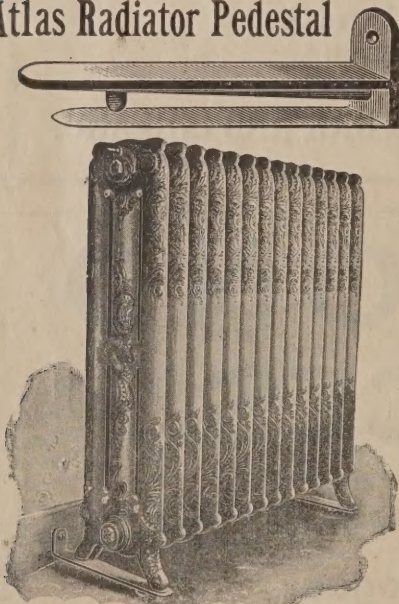
## A NEW PRINCIPLE

is embodied in the construction of the **FORBES** furnace. We get away from the old form of furnace construction entirely, and that is why we get better results than are possible with any other furnace. In use the **HOTAIR PIPES** and **COOL SMOKE PIPE** prove where the heat is going, and the small amount of coal required to run the furnace is a surprise to everybody. We've territory left for you—write us for an agency, and ask for our pamphlet.

### Tubular Heating and Ventilating Co.,

228 Quarry St., Philadelphia.

Avoid Cutting Your Carpet  
BY USING THE  
**Atlas Radiator Pedestal**



Does Away with Radiator Boards.  
Neat in Appearance Easily Adjusted. Saves Time  
and Labor. For prices, address

**ATLAS RADIATOR PEDESTAL CO.,**  
377 & 379 Bank St., New London, Conn., U. S. A.

**"O. H." One Piece  
Stove Pipe  
Elbows.**

SOLD BY ALL

**Jobbers.**

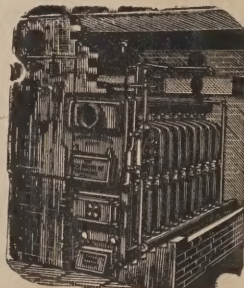
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Elbow Co., Ltd.,

Sole Manufacturers, **WAVERTY, N. Y.**



—"STRONG indeed is the force of habit," says the *Buffalo Enquirer*. "The Police Justice had formerly been a bartender. He had gone into politics."



Gold Beller

### THE H. B. SMITH CO.

Manufacturers of STEAM AND WATER

## Heating Apparatus,

FOR PUBLIC AND PRIVATE RESIDENCES.

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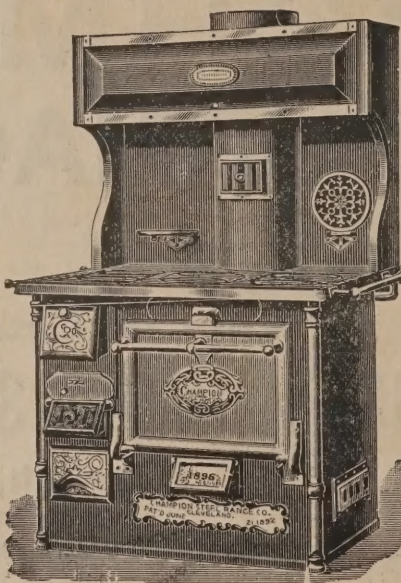
Radiators: Union, Royal Union, Champion, Imperial.  
Boilers: Mercer, Gold, Cottage, Mills.

ADAPTED FOR STEAM OR WATER.

SALESROOM: 133-135 CENTRE ST., N. Y.

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FOUNDRY, WESTFIELD, MASS.



## CHEAPNESS.

The tendency of the times is toward a will-o'-the-wisp called "cheapness." While prices have been going down, qualities have been going down too, and deception has become so widespread as to almost pass unnoticed.

We lay it down as a principle, eternal as the hills, that "cheap" things are never cheap. They are neither durable nor satisfactory. **You have got to pay a fair price if you want to get a good quality. Good things cannot be purchased at the price of bad things.**

Steel ranges are no exception to this rule; the **CHAMPION and MARQUART RANGES** are worth more than ranges made out of cheap material.

No one can sell a first-class range at a less price than we do.

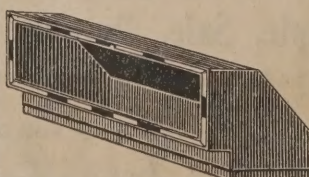
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**Champion Steel Range Co.,**

251-9 Viaduct, Cleveland, O.

## Novelty Ventilated Wall Pipe.

ABSOLUTELY FIRE PROOF.

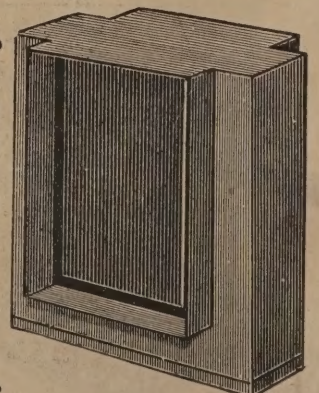


The Novelty Ventilated Wall Pipe is manufactured of best bright tin, by machinery made especially for the purpose, and is made in lengths from 1 inch to 8 feet, the joints all being double seamed, and is constructed in such a manner that any mechanic can, if it becomes necessary to shorten pipe, remove socket end, cut pipe off and replace socket in a few moments.

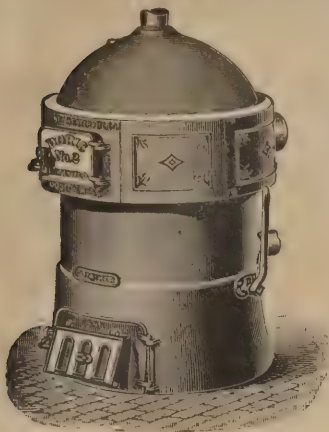
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Manufactured by

**JOHN P. SCHAEFFER, No. 18 Wood St., Pittsburgh, Pa.**







DORIC  
seamless Tubular Hot Water Heater.

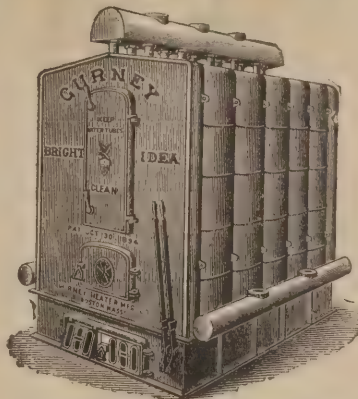
New York Branch:  
48 CENTRE ST., NEW YORK CITY.

Works—E. Boston, Mass.



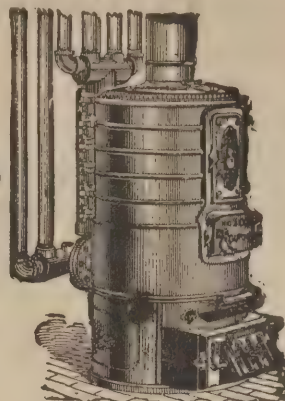
HOT WATER HEATERS, STEAM BOILERS AND RADIATORS.

Perfect  
in  
Construction,  
Thoroughly  
Effective  
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Economical  
of Fuel.



BRIGHT IDEA HOT WATER HEATER.

Used and  
recommended  
by the  
Leading  
Engineers  
and  
Architects  
of the  
Country.

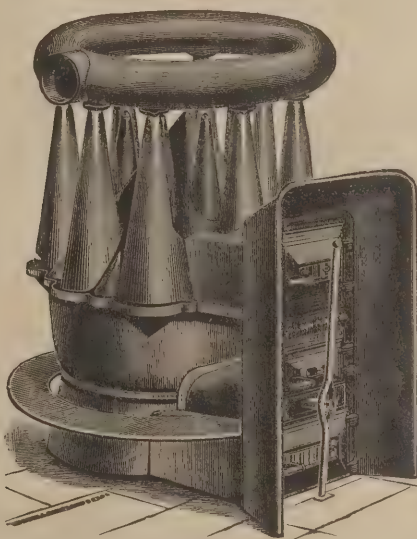


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Hot Water Heater.

Send for  
Latest Illustrated Catalogue.

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11 Sizes.

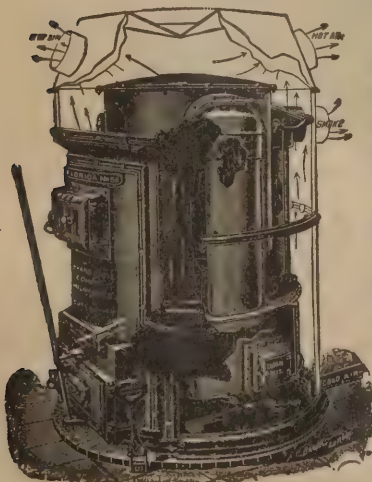
BRICK AND PORTABLE.

Circulars and Price-List  
on Application.

CHILSON FURNACE CO.,  
MANSFIELD, MASS.

BRAMHALL, DEANE CO., 264 Water St.  
New York, Agents for N. Y. City and Vicinity.

THE FAMOUS FLORIDA.  
FOR COAL.



## Brand's Famous Furnaces.

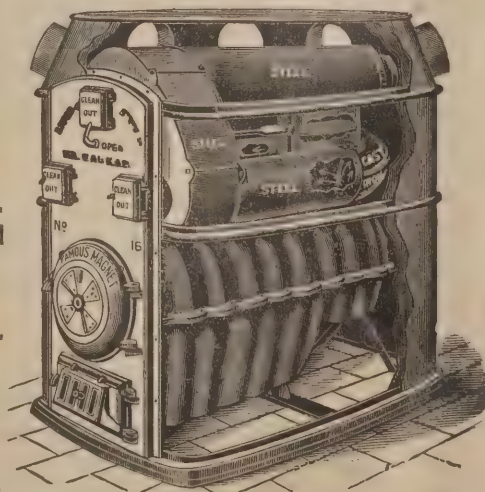
Revertible Flues.  
Extra Large Radiator.  
Heavy Fire Pot.  
Revolving or  
Flat Grates.  
Very Large Ash Pit  
Door.  
Spacious Ash Pit.  
Gas and Dust Proof.

Efficiency in Heating  
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Easy Access to  
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Made in 3 Sizes.  
33-50-60 Inch Fire  
Boxes.

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THE FAMOUS MAGNET.  
FOR WOOD



See This!

SAVES 10 per cent. in cost of pipe.  
SAVES 90 " " in time of erection.

SOUTHER'S LONG LENGTH STOVE PIPE. 6 ft., 8 ft. and 10 ft. lengths, in common and smooth iron.  
IT SELLS, OF COURSE.

E. E. SOUTHER IRON CO., 2206 North 2nd St., ST. LOUIS.



DON'T GO CHASING SHADOWS  
**THE TWO BRIC**  
 THEY OUTSHIN

**THE "NEW PROCESS" VAPOR STOVE**

*The stove that revolutionized the Gasoline Stove business in 1890.*



**IT  
 STILL  
 LEADS!**

No. 3, "NEW PROCESS" VAPOR STOVE.

Don't overlook the "**STANDARD**" **GIANT BURNER**, a complete line of medium priced generating gasoline stoves in *Cabinet Frame*.

OUR STOVES ARE KNOWN BY THE COMPANY THEY KEEP

**EASTERN STATES:**

F. M. BORDEN & BRO., Philadelphia.  
 EUGENE MUNSELL & CO., New York City.  
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**THE STANDARD**



# FOLLOW THE LIGHT OF BRIGHTEST STARS! BEAT ALL OTHERS.

## THE "STANDARD" WICKLESS,

*The stove that will revolutionize the Oil Stove business in 1899.*



**IT  
WILL  
LEAD!**

No. 275, "STANDARD" WICKLESS.

*We present you with the handsomest and most complete line of*  
**OIL and GASOLINE STOVES.**  
*The Greatest Values ever offered.*

**We have THE "STANDARD" WICK BLUE FLAME—an old friend in new dress and up-to-date.**

THE FOLLOWING WELL KNOWN JOBBERS SELL THEM.

### CENTRAL STATES:

COOK & VAN EVERA CO., Chicago.  
MORLEY BROS., Saginaw, Mich.  
TOWNLEY STOVE CO., Terre Haute, Ind.  
H. KOCH & SONS, Evansville, Ind.  
MARQUA BROS. & PATTISON, St. Louis, Mo.

### THE NORTHWEST:

FARWELL, OZMUN, KIRK & CO., St. Paul.

### THE SOUTHWEST:

THE TOWNLEY METAL CO., Kansas City.

### THE SOUTH:

W. B. BELKNAP & Co, Louisville.

**LIGHTING CO.,** CLEVELAND, OHIO.

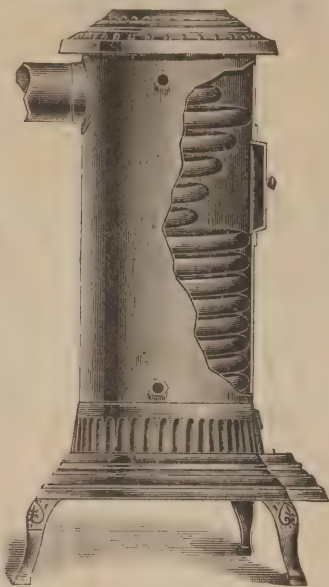


## The Combination Hot Water Heater.

THE BEST THING FOR

## HEATING

Houses, Stores, Conserva-  
tories and Bath Rooms by



the combination of Hot  
Air and Hot Water if de-  
sired, or Hot Water alone.

SIMPLE, PERFECTLY MADE  
AND LOW PRICED. . . .

Send for Circulars.

THE NATIONAL PIPE BENDING CO.,  
160 River Street,  
NEW HAVEN, - CONN.

## THE WASTE HEAT RADIATOR

Made by

BACKUS RADIATOR CO.,  
CLEVELAND, O.

T. H. GREEN & CO., Duluth, Minn.

It will add 50 per cent. to the ca-  
pacity of a furnace. Can heat a  
seven-room house with our stove.



Let us  
send you  
Circular  
and  
Price List.

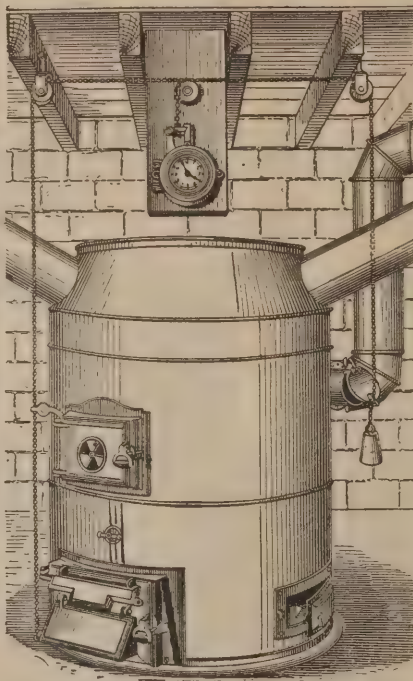
—NOT RESPONSIBLE.—MOTHER: "To  
think that my little Ethel should have  
spoken so impertinently to papa to-day  
at dinner! She never hears me talk in  
that way to him."

Ethel (stoutly): "Well, but you  
choosed him and I didn't."—*Exchange.*

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GUARANTEED TO SAVE COAL.

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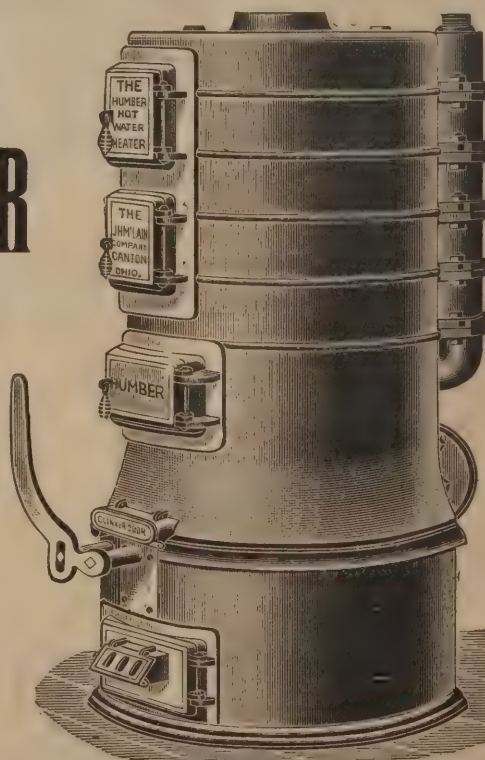
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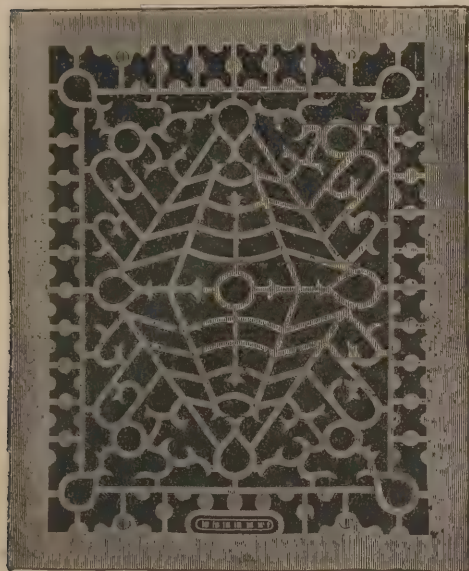


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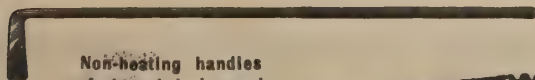
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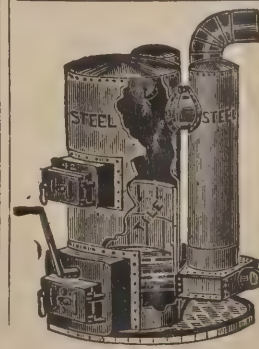
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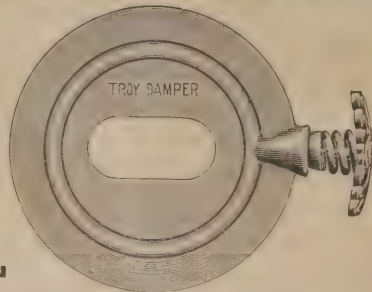
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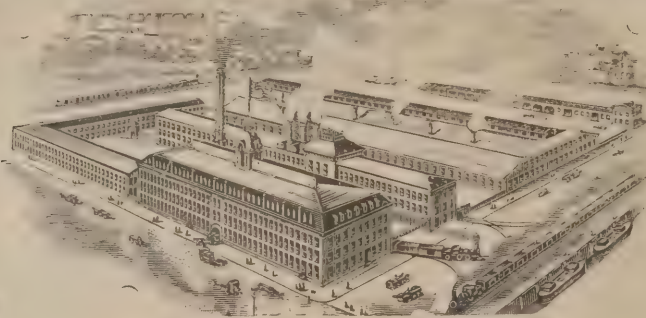
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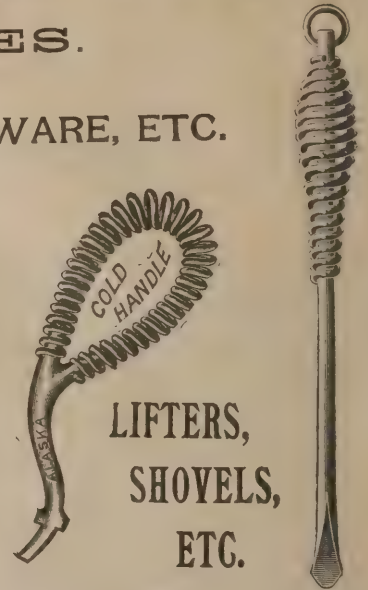
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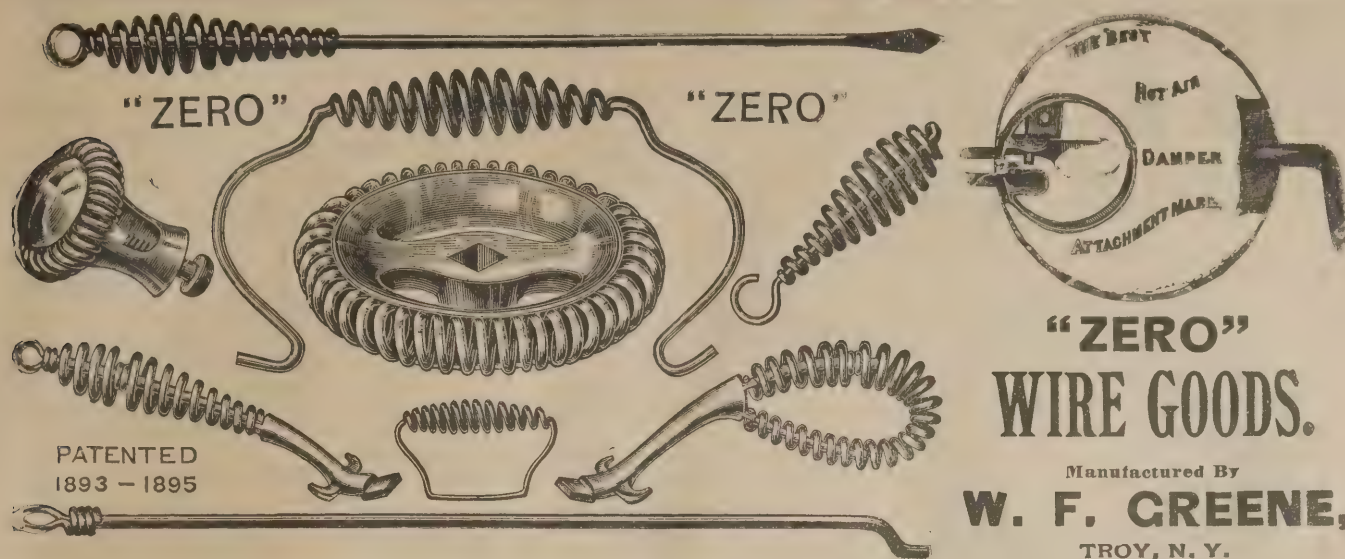
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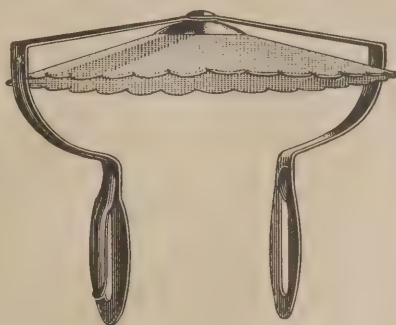
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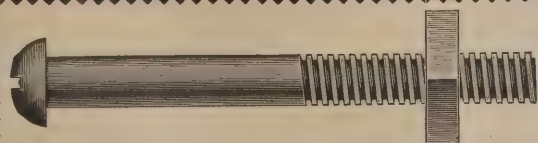
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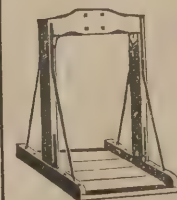
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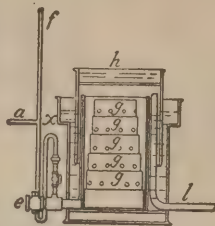
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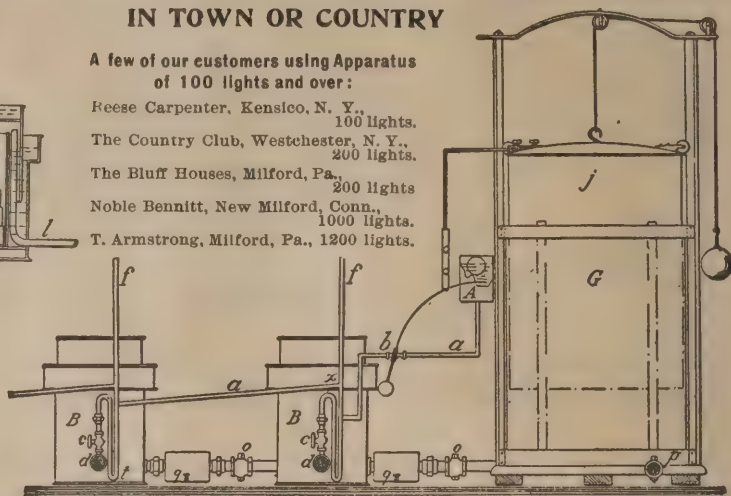
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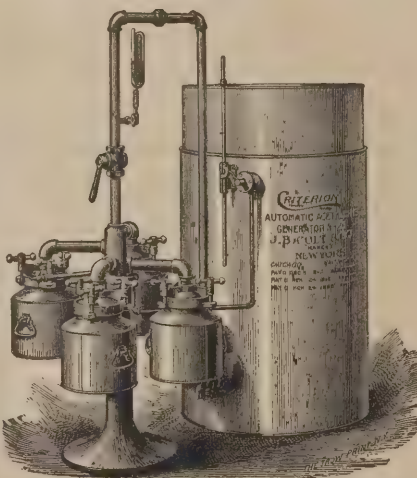
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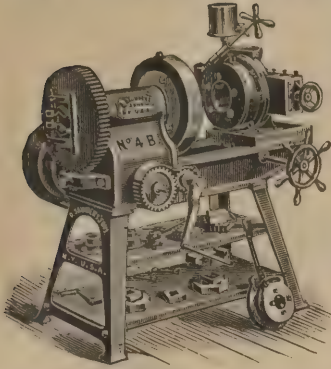
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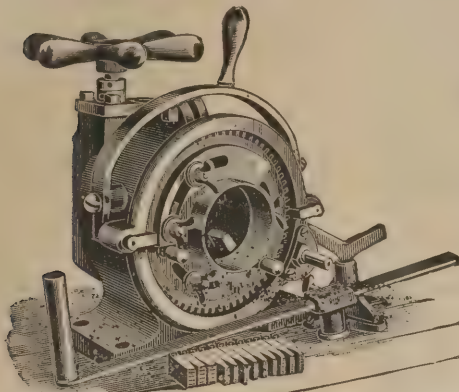
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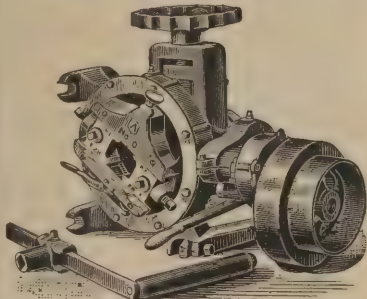
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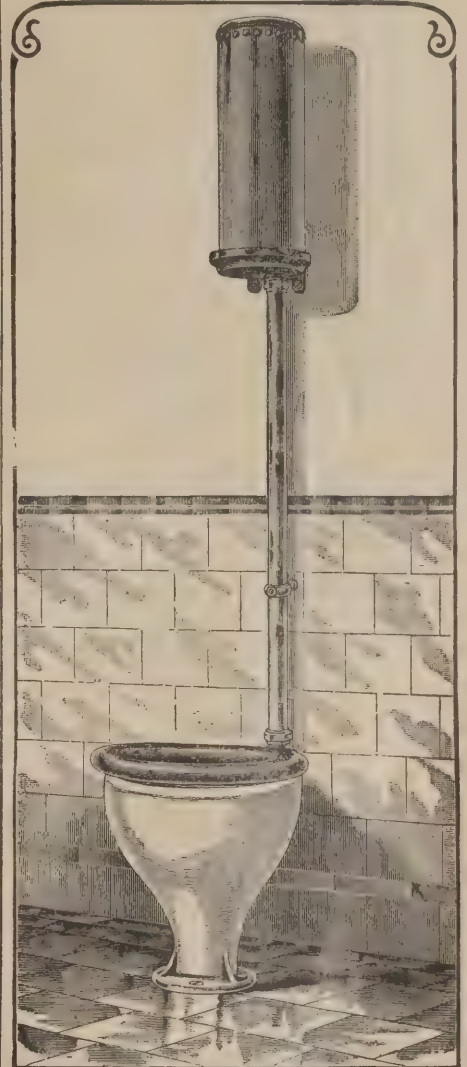
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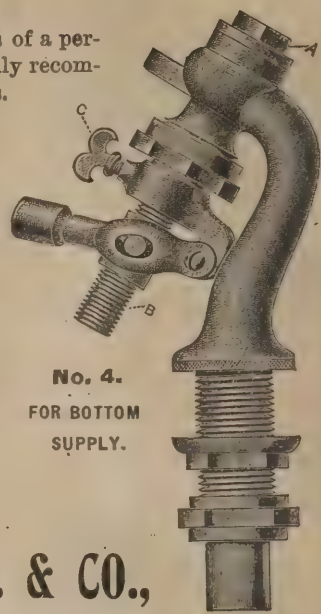
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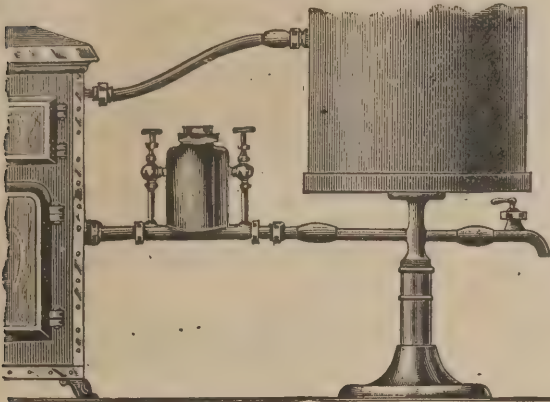


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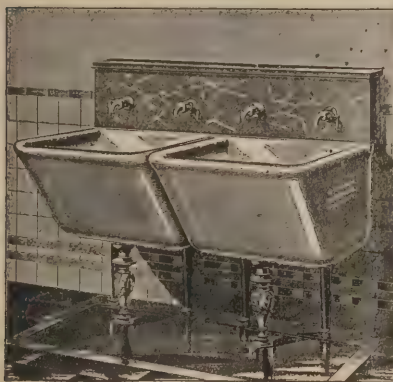
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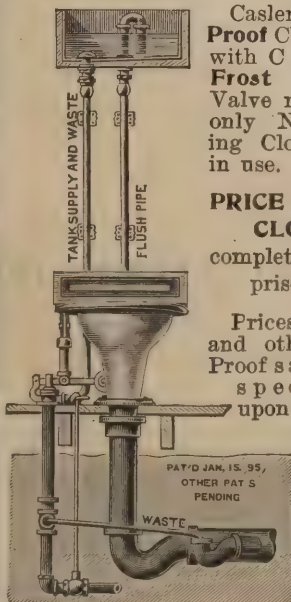
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This manual is, in short, well adapted to the practical requirements of plumbers and gas fitters.

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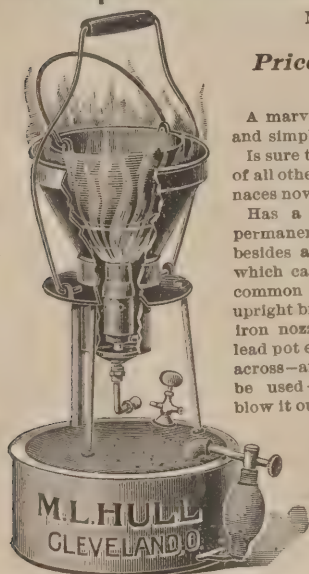
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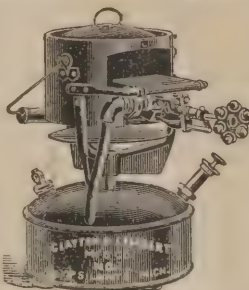
"Which one is 22 cents?"

"The top one."

"Then why don't you make your sign read, 'From 22 Cents Down?'" retorted the other, putting the money back in his pocket and walking out with a look of disgust on his face.—*Youth's Companion*.

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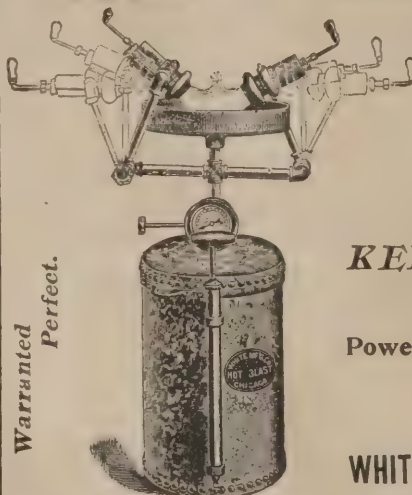
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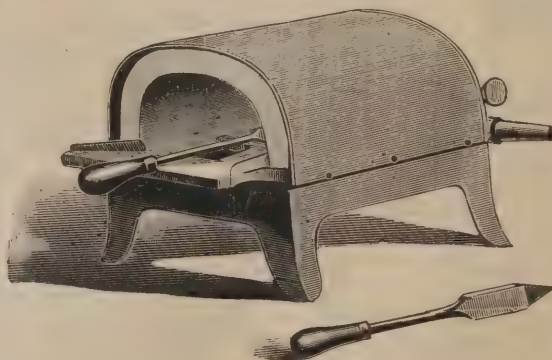
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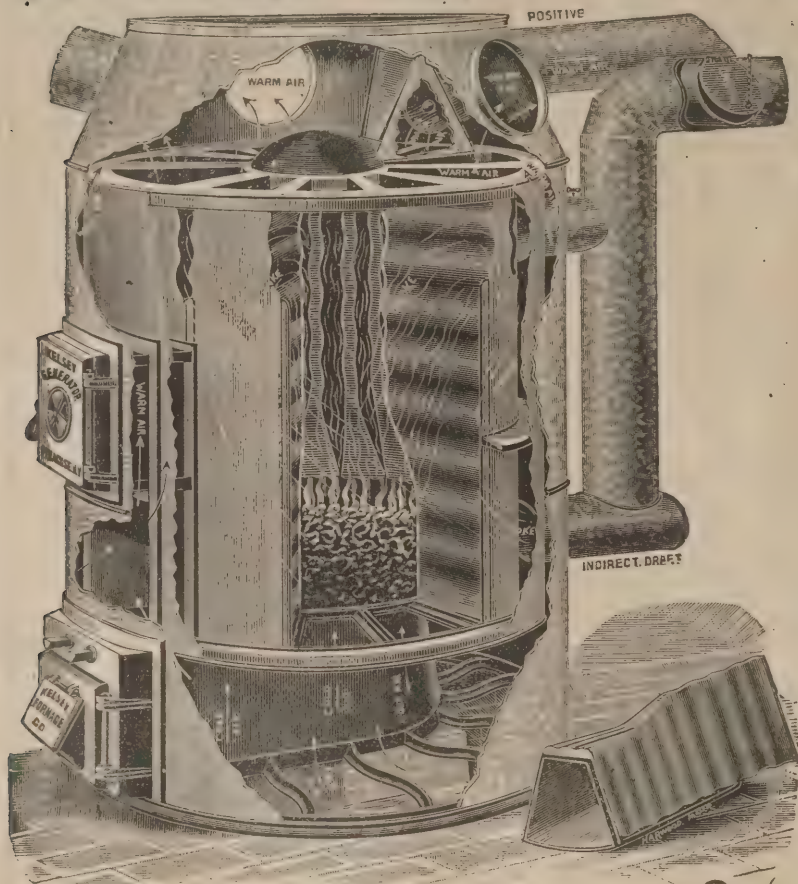
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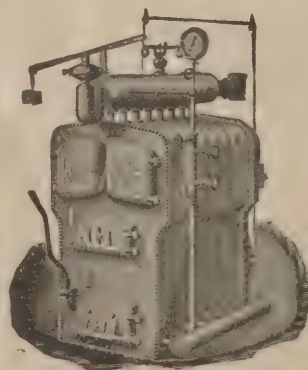
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# THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, December 24, 1898.

DAVID WILLIAMS COMPANY, PUBLISHERS.

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Volume L.....No. 26.  
Index to Reading Matter.....Page 53.

The editorial and business offices of *The Metal Worker* at Chicago have been removed from 59 Dearborn street to 805 Fisher Building.

## A New Process of Combustion.

In *The Metal Worker* of November 12 we printed a description with illustrations of a new process of combustion, which was part of a lecture delivered before the Franklin Institute by P. J. Schlict. The number of letters we have received on the subject is sufficient evidence that the article was read with interest, and excited no little attention among stove and furnace men, and others who wished to learn something more about this apparently impossible mode of supplying air to a fire. The account we printed was little more than a description of the very simple device employed for admitting air, together with a reference to some power plants and domestic heating apparatus where it had been used, and the economy it had effected in coal consumption. No explanation was given or attempted of why the system operated in apparent contradiction of natural law, though, of course, there must be an explanation and one in keeping, too, with the laws of nature. Two devices, it will be remembered, were described, one for power plants, consisting of a cylinder somewhat smaller than the chimney inserted a short distance in the top of the stack so as to leave an annular space through which the draft descended to feed the fire. In the case of the hot air furnace the air was admitted through a small tube inserted in the flue a little way from the furnace, and bending back a short distance along the edge of the smoke pipe toward the fire. The principle in both cases was the same, the air to feed the fire being admitted in the flue so that it could travel back along the sides of the flue, and in a contrary direction to the course taken by the products of combustion till it reached the fire and supplied oxygen to the burning fuel. In all cases the ordinary drafts and fire doors were tight shut, so that the combustion had to be fed with air from the source indicated.

## Of Interest in House Heating.

In view of the extraordinary features of this system, it is no wonder that the examiners at Washington at first refused to grant a patent on the ground that it would not operate, and had to be convinced by

witnessing a practical test before they would allow the patent. But the point that deserves attention in this curious system is not that it operates, however interesting that fact may be from a scientific or theoretical standpoint. The practical interest lies in the claim made for it that the fire burns more evenly and better, that the fuel is thoroughly consumed without the formation of clinkers, and that it effects a very considerable saving in the coal bill. If all the claims made for the system are true, and this is something for time and experience to demonstrate, makers of furnaces and house heating boilers and, perhaps, stoves, too, ought to look into it and find out if it promises to overturn the present systems of coal burning and lead to a revolution in flue and chimney construction, and in furnace and heater design. In this age of rapid progress and incessant change hardly a month passes without bringing some wonderful invention or discovery. Many of these are quickly taken up and assimilated into the trades and industries, while others, after serving for a nine days' wonder, pass out of sight without ever finding any practical application.

## A Remarkable December.

"December," says *Dun's Review*, "is adding a surprising close to the most surprising year of American history. November had surpassed all other months of the century in volume of business and production, and thus far December is doing even better, in payments through clearing houses, in railroad earnings, in foreign trade, in output of pig iron, and in activity and strength of securities. And that is saying a great deal, for in all these and other tests November was far the best month of American financial history." This tells, in a nutshell, the tale of revived prosperity which is ringing so soothingly in the ears of many business men of this country in the closing weeks of 1898. The clearing house returns, which afford about the best criterion of the volume of business throughout the country, show it to be far beyond precedent in any previous December. So far, they indicate an excess of business over last year of more than 23 per cent., and an increase of 26 per cent. above the figures of the corresponding period of 1892. When it is remembered that business in 1892 was very far in excess of that of any previous year, and especially in December, the current volume of transactions is the more worthy of note. The earnings of the transportation companies afford another good gauge of the degree of business activity. Railway earnings in December thus far display an increase of 5 per cent. over last year and of 7 per cent. over 1892 for the same period. The wonderful growth in our export trade, too, is a remarkable feature of the situation. The exports of American merchandise from the port of New York in the first three weeks of this month were over 25 per cent. larger than those of 12 months ago, while the imports were 4 per cent. smaller. In the industries of the country, a condition of unexampled activity prevails. Especially is this the case in the iron and steel trade, which many con-



sider an unfailing business barometer. All records of production and consumption are being broken in this department, and with the entire furnace capacity of the country in full blast, turning out 1,000,000 tons of pig iron a month, a scarcity of iron is already feared. The woolen and cotton mills are showing a marked revival in the demand for textiles, with higher prices for those products; and so it goes with the shoe and leather trade, and with practically every other leading branch of business. Wheat and corn are going abroad in immense volume, and the foreign demand for our agricultural products gives no sign of an early diminution. Money is in such abundance that the great savings banks have been forced to announce that it is no longer practicable for them to pay 4 per cent. interest on deposits.

### A Bright Outlook.

It is not strange, in view of this remarkable combination of circumstances, that the stock market has been extraordinarily active and strong, and that the value of practically every kind of stocks and bonds has advanced under the inspiration of a volume of speculative and investment trading which goes away beyond anything before known. Wall Street can find no warrant anywhere for hesitation or doubt, and Wall Street is always the first to discover the faintest of clouds on the business horizon. It is true that this revival of business activity is not evenly distributed over the entire country. Nor has it brought more remunerative prices for goods in some of the lines represented by this paper. In some sections, notably in the Eastern States and particularly in New England, the development of prosperity has been very slow and there are some lines of trade which have scarcely felt the touch of improvement as yet. The West has been the most favored region. But the present indications appear to be unmistakably pointing in the direction of a more general revival of business in the coming year; a revival of which the East, also, should receive its due share. The favorable conditions detailed above give sufficient ground for this belief. In wishing our readers A Merry Christmas, therefore, we believe that the sentiment will find a more general and cheerful response than could be looked for at this season in several years past.

Christmas shopping has been done this year on a bigger scale than ever before, if the testimony of the department stores be taken as proof. The proprietors of a number of these large emporiums in the large cities of the country, quoted last week by one of the leading commercial papers, agreed in reporting record breaking sales of holiday goods. Some had done more than double the business of a year ago. Moreover, they note a general tendency on the part of the public toward the purchase of a more expensive and better class of wares. Manufacturers of such articles of luxury as jewelry, pianos, &c., also support this testimony, all of which pleasantly indicates that there is considerable more surplus cash floating around than has been the case at this season in several years past.

### ODDS AND ENDS.

The past week has been very fruitful in announcements of new "trusts." Among the products in which combinations are said to be forming are such varied articles as canned goods, corsets, spool silk, straw boards, peanuts, cedar shingles, flint bottles, rags, and lead. The promoters of these industrial combinations are busily engaged in making hay while the sun shines. And they are raking in a good deal of it, too. Ten mil-

lion dollars of stock, the amount said to have been presented to the promoters of the Tin Plate Trust, is a neat commission.

Dr. Raoul Pictet, the noted Swiss chemist, who arrived in New York last week from Europe on a visit to the United States, is one of the foremost authorities on liquid air, with which he has performed some remarkable experiments. Among other feats, he has succeeded, by means of liquid air, in freezing carbonic acid into snow-white blocks. Dr. Pictet has now under way some experiments with acetylene gas which, if successful, will, he says, greatly increase the usefulness of the gas as an illuminant.

It is reported that the populace of Granada, Spain, recently vented their wrath at the discomfiture of their country in the late war by stoning the statue of Columbus, because, by the discovery of America, he made the present woes of Spain possible. Carrying out the idea to its logical conclusion, they should also have stoned Ferdinand and Isabella, who fitted out Columbus' expedition and enabled the explorer to give a new world to Leon and Castille.

A curious state of things was discovered the other day by the city works officials of Dayton, Ohio, when investigating the electrolysis of water pipes. It was found that stones and pebbles near the pipes were in some places electro plated with the metal of the pipes.

Here is an interesting arithmetical problem that is going the rounds: A is indebted to B \$5, B to C, C to D, D to E, E to F, same amount. A, B, C, D and E each have \$1 and no more, and consequently they cannot pay their debt. They put their money all together. A takes the \$5, goes to B, pays his debt and gets his receipt. B does the same to C, C to D, D to E and E to F. A, B, C, D and E are out of debt, and F has his money. Who, if any one, is the loser?

The *Utica Observer* relates a remarkable freak that the wind played recently on the Presbyterian church at New Hartford, N. Y. It blew the steeple above the belfry out of plumb about 25 degrees, so that the spire pointed in a northwesterly direction, and it was feared that it would fall. Next morning men were about to set to work straightening the steeple and putting in stronger supports, when the wind veered around and blew it back into its original position.

One of the advantages that is being claimed for acetylene gas is that the products of its combustion are not injurious to plant or animal life, as is the case with coal gas. A test is reported to have been made with acetylene recently in a greenhouse, in which absolutely no bad effect was produced, whereas coal gas had a markedly injurious influence upon the growing plants.

Nowhere is the motor carriage, as an institution, so firmly established as in Paris. Horseless vehicles, both public and private, of all sizes and descriptions, throng the streets of the French metropolis and give quite a new appearance to the public thoroughfares. They are operated under very strict municipal regulations, which prohibit the running of automobiles of any type except by licensed engineers or conductors. These persons are obliged to pass an examination before an employee of the city Engineering Bureau, both in the management of their vehicles and in the handling and repair of the machinery. The practical examination takes place over a special track half a mile long, which embraces the steepest hill in Paris and is provided with all kinds of pavements. To test their steering ability dummies of pedestrians, cyclists, &c., are placed in the road and the driver must prove his alertness and ability by coming down the hill and avoiding collision with the lath and canvas figures. The owners of automobiles who wish to run them personally have to pass a similar examination.

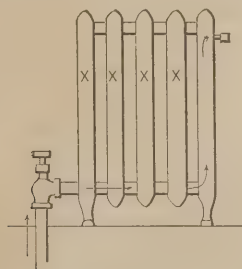


# THE LETTER BOX.

## HOW IS AIR EXPELLED FROM RADIATOR?

From G. S. W., Middletown, N. Y.—Please explain how the steam enters and the air is expelled from a radiator with a simple pipe connection working under low pressure and also for hot water. How does the steam travel when it enters the radiator and the air valve is open? Does it travel as shown by the arrow in the cut to the furthest loop and force the air out? If so, what becomes of the air in the middle loops marked X after the steam comes and the air valve automatically closes?

Answer.—For hot water the air valve should be placed as near the top of the radiator as possible, so that as the water rises in the system when it is filled the air may escape from the air valves and the water reach the highest part of each radiator or coil. The travel of steam in a radiator can be readily followed by placing the hand on the radiator as the steam enters. It will be found that steam enters the first loop and fills it, driving the air out ahead of it before the steam enters the second loop, and so on till the radiator is filled with steam. The air valve should be placed about midway of the height of the radiator.



*How is Air Expelled from Radiator?*

tor, for as the steam reaches the last loop it will enter at both the top and the bottom, and the air valve so located will allow the entrapped air to escape. By watching the operation of a radiator it will be found that the steam does not travel as shown by the arrow.

## TAR ON TIN ROOFS.

From W. Q., Hicksville, N. Y.—From time to time questions are asked in *The Metal Worker* in regard to tar for painting tin roofs, and there may be different grades of this material with which I am not familiar. To satisfy some "questionist" I have taken the liberty of sending you a sample that I took off a roof. The house was built in 1872 and a tin roof was put on. I do not know whether this roof was ever tight or not; any way, it developed leaks and some one had a hobby for tar. Every time a leak turned up the order was given to put on tar, until finally it has reached the thickness in parts of the sample sent. The present owner of the building has had another roof put on over the old roof, with more pitch and slope given to it. I had the honor of putting on the tin roof and give assurance that it will not be necessary to use tar when I get through with it.

Note.—The sample received is coal tar in the hard form and called by some pitch. In the thicker parts it is  $\frac{1}{2}$  inch thick and  $\frac{3}{8}$  inch thick at the thinnest part. Our correspondent does not state what effect the tar had on the tin. This is a very interesting question. Some contend that the tar will start rust spots and will eventually destroy the tin instead of protecting it. We feel sure that our readers will be glad to hear from him as to the effect of the tar.

## SOME QUESTIONS IN FURNACE HEATING.

From H. M. S., Bayonne, N. J.—I do not know that I can "come to the assistance" of "W. B.," Bridgeport, Conn., who asked information in *The Metal Worker* of December 17. It is difficult to advise in such matters without knowing more of the conditions that surround the case, but I have had in some respects a similar experience with a furnace in my house, and possibly the course that I have pursued may give him a suggestion. When I first started up the furnace I found that one of the hot air pipes would not furnish any hot air, while all the others worked perfectly. I went into the cellar to see what was the trouble and found that all the pipes were hot except this one, which was cold. I have wrapped this pipe with several layers of fire proof paper, covering every part of its exposed surface. This prevented the cold air in the cellar from chilling it, as it was on the cold side of the cellar. It now works perfectly and gives out as much heat as any of the others.

From W. H. C., Binghamton, N. Y.—In reply to the inquiry of "W. B." in *The Metal Worker* of December 17 I would say that there is no reason, in my opinion, why that pipe should not heat if it is properly connected with the furnace and carried to the flue. An 8-inch pipe should be taken from the top of the furnace so that the rest of the pipes will not rob it of its share of the heat. It should be run with a pitch to the upright flue. Those who engage in hot air furnace heating should remember that hot air has one characteristic directly opposite to that of water. Water will run down hill; hot air will not. Hot air will flow freely when there is an upward pitch in the pipe or whatever carries it. I have been in the business for 30 years and put up 64 furnaces last year and 49 this year. These furnaces all operate, for the reason that I observe this one rule of providing an upward pitch in all of my pipes and make all turns so that they will be without any sharp corners, but smooth, to reduce the natural friction that comes in making a turn. Little attention is paid by many furnacemen as to where pipes are located on a furnace, particularly when a cone top is used. Any pipe that runs a long distance or has a great deal of work to do should be taken from the top higher up than the others are.

From A. B. K., Burlington, Vt.—Alluding to the letter from "W. B.," Bridgeport, Conn., in *The Metal Worker* of 17th inst., whose furnace pipe leading to second story fails to deliver any warm air, "W. B." states that the vertical pipe is on the outside of the building and that many experts had failed to suggest a remedy.

The failure of this pipe to perform its function is an easier problem to solve than that involved in the question as to what sort of experts they could have been who failed to discover the difficulty and suggest a remedy. They certainly were not experts in the art of warm air heating. If this hot air pipe is, as he says, outside of the building, which I think must be an error in printing, a misstatement or some sort of a mistake, or even if it is inclosed in an outside wall, let it be got in at once and carried up in some inside partition or through some closet, or anywhere inside the house. This change will probably remedy the whole difficulty if the heater is supplied with a circulation of air through a proper duct, either from one of the doors or from the house. In the latter case the doors in the hall and adjoining rooms should be generally left open, so that the air can circulate freely. If the heater is arranged



to take air from both outside and inside, there should be a separate duct for each, and that from outside should be entirely shut off when taking air from inside. The rectangular pipe 4 x 10 inches by 3 feet would better be replaced by a larger pipe either round or square, perhaps, not necessarily for the working of the job but on general principles. The cut shows the 7-inch horizontal pipe to pitch down away from the heater, or at best to be about level. This is a defect and should be remedied by giving it an incline upward toward the vertical pipe. If these suggestions are carried out I am sure the unruly member will be brought to terms; but if not, cover all the exposed pipes with some non-conducting substance, such as old woolen blankets or carpets wound on neatly and tied, or some of the many non-conducting coverings known to the trade. If everything else fails send to John Demarest, 165-167 Fort Hill square, Boston, for his Patent Positive heat distributor.

I trust that these suggestions may aid in overcoming the difficulty and that "W. B." will report after applying the cure.

the nuts on the stove rods so as to put in a new fire pot. Is there any good method of making nuts loosen when they have become burned fast? Where can I get the best cold chisel? I find it difficult to get one properly tempered.

The Cuban Tariff.

Special Commissioner Robert P. Porter, who recently returned from an extensive tour through the island of Cuba for the purpose of studying its commercial and industrial conditions, with a view to formulating a permanent tariff for the island, has made his report to the Secretary of the Treasury, who has transmitted it together with a favorable indorsement to the President. Mr. Porter's report and recommendations have been subjected to careful examination by Assistant Secretary Howell and other tariff experts of the Department, with the result that the schedules as they now stand have received an unqualified indorsement. Some features of the new tariff, which it is proposed to put in force on the island on January 1, are given below:

Class II—Metals, and All Manufactures in Which Metal Enters as a Principal Element.

GROUP 2.—CAST IRON.

|  |            | Old rate<br>for all<br>imports<br>except<br>Spanish.<br>Pesos. | Rate<br>originally<br>adopted by<br>United<br>States<br>for<br>all imports.<br>Pesos. | Per<br>centage<br>of<br>reduc-<br>tion. | Proposed<br>rate.<br>Dollars. |
|--|------------|--|---|---|-------------------------------|
| 28 Pigs, G. W.   | 100 kilos. | .50  | .20   | 60                                      | .10                           |
| 29 Articles not coated or ornamented with another metal or porcelain, neither polished nor turned—           |            |  |   |   |                               |
| a Bars, beams, plates, grates for furnaces, columns and pipes, G. W.   | 100 kilos. | 1.20   | .60   | 50                                      | .50                           |
| b Lubricating boxes for railway trucks and carriages and railway chairs, G. W.                               | 100 kilos. | .75  | .75   |   | .35                           |
| c Articles, other, G. W.   | 100 kilos. | 2.25   | .75   | 66.6                                    | .75                           |
| 30 Articles of all kinds, not coated or ornamented with another metal or porcelain, polished or turned, T.   | 100 kilos. | 3.60   | 1.20  | 66.6                                    | 1.20                          |
| 31 Articles of all kinds, enameled, gilt, tinned, or coated or ornamented with other metals or porcelain, T. | 100 kilos. | 5.80   | 1.80  | 69                                      | 2.30                          |

GROUP 3.—WROUGHT IRON AND STEEL.

|  |            |       |      |      |      |
|--|------------|-------|------|------|------|
| 32 Iron, soft or wrought, in ingots or tochos; steel in ingots, G. W.  | 100 kilos. | 1.00  | .40  | 60   | .40  |
| 33 Wrought iron or steel, rolled—  |            |       |      |      |      |
| a Rails, G. W.   | 100 kilos. | .85   | .85  |      | .425 |
| b Bars of all kinds, including rods, tires, hoops and beams, G. W.   | 100 kilos. | 2.40  | .90  | 62.5 | .90  |
| c Bars of all kinds of fine crucible steel, G. W.  | 100 kilos. | 4.10  | 1.50 | 63.4 | 1.60 |
| 34 Sheets, rolled—   |            |       |      |      |      |
| a Neither polished nor tinned, of 3 mm. and more in thickness, G. W.   | 100 kilos. | 2.90  | 1.10 | 62.1 | 1.10 |
| b Neither polished nor tinned, of less than 3 mm. in thickness, and hoop iron, G. W.   | 100 kilos. | 3.45  | 1.20 | 65.2 | 1.20 |
| c Tinned, and tin plate, G. W.   | 100 kilos. | 4.60  | 1.50 | 67.4 | 1.50 |
| d Polished, corrugated, perforated, cold rolled, galvanized or not, and bands of polished hoop iron, G. W.   | 100 kilos. | 3.90  | 1.30 | 66.6 | 1.30 |
| 51 Manufactures of tin plate, T.   | 100 kilos. | 10.90 | 3.00 | 72.5 | 4.00 |
| Wrought iron or steel—   |            |       |      |      |      |
| 52 Articles of all kinds not specially mentioned, common, even coated with lead, tin, zinc, or painted or varnished—   |            |       |      |      |      |
| a In which sheet predominates, T.  | 100 kilos. | 7.40  | 2.00 | 73   | 3.00 |
| b In which sheet does not predominate, T.  | 100 kilos. | 5.80  | 1.80 | 68.9 | 2.00 |
| 53 Articles of all kinds not specially mentioned, fine, i. e., polished, enameled, coated with porcelain, nickel, or other metals (with the exception of lead, tin, or zinc), or with ornaments, borders, or parts of other metals, or combined with glass or earthenware— |            |       |      |      |      |
| a In which sheet predominates, T.  | 100 kilos. | 8.50  | 2.50 | 70.6 | 3.00 |
| b In which sheet does not predominate  | 100 kilos. | 7.50  | 2.50 | 66.6 | 3.00 |

GROUP 5.—OTHER METALS AND THEIR ALLOYS.

|  |            |       |       |      |      |
|--|------------|-------|-------|------|------|
| 66 Mercury, G. W.  | kilogram.  | .40   | .40   |      | .20  |
| Nickel, aluminium, and alloys having for a basis these metals—                 |            |       |       |      |      |
| 67 In lumps or ingots, G. W.   | 100 kilos. | 5.60  | 5.60  |      | 3.00 |
| Tin and alloys thereof—  |            |       |       |      |      |
| 68 In lumps or ingots, G. W.   | 100 kilos. | 10.00 | 4.00  | 60   | 4.00 |
| Zinc, lead, and other metals not specially mentioned, as well as their alloys— |            |       |       |      |      |
| 69 In lumps or ingots, G. W.   | 100 kilos. | 2.50  | 1.00  | 60   | 1.00 |
| Nickel, aluminium, and their alloys—   |            |       |       |      |      |
| 70 In bars, sheets, pipes, and wire, G. W.                                     | 100 kilos. | 15.50 | 14.00 | 9.7  | 7.00 |
| Tin and alloys thereof—  |            |       |       |      |      |
| 71 In bars, sheets, pipes, and wire, G. W.                                     | 100 kilos. | 17.00 | 7.00  | 58.8 | 7.00 |
| Zinc, lead, and other metals—  |            |       |       |      |      |
| 72 In bars, sheets, pipes, and wire, G. W.                                     | 100 kilos. | 4.00  | 1.50  | 62.5 | 1.50 |
| 73 Tin hammered in thin leaves (tin foil) and capsules for bottles, T.         | kilogram.  | .07   | .035  | 50   | .04  |
| Nickel or aluminium, and their alloys—   |            |       |       |      |      |
| 74 Articles of all kinds, T.   | kilogram.  | .80   | .50   | 37.5 | .50  |
| Tin and alloys thereof (Britannia metal, &c.)—                                 |            |       |       |      |      |
| 75 Articles of all kinds, T.   | kilogram.  | .75   | .50   | 33.3 | .50  |
| Zinc, lead, and other metals, and their alloys—                                |            |       |       |      |      |
| 76 a Articles, gilt, silvered, or nickeled, T.                                 | kilogram.  | .85   | .30   | 53.8 | .30  |
| b Articles, other, T.  | kilogram.  | .30   | .15   | 50   | .15  |

WANTS STOVE REPAIR WRENCH.

From O. T., Philadelphia, Pa.—Although I am an old tinner I am willing to confess that I am not up to all the improvements and conveniences for doing work. I would like to ask the readers of *The Metal Worker* if there are any improved wrenches for taking the nuts off of the rods of old stoves. I broke an old square stove that had become thin in parts all to smash the other day trying to cut

The Toronto & Hamilton Sewer Pipe Works at Hamilton, Ont., were destroyed by fire on December 17. Three large kilns and about 40,000 feet of pipe were included in the loss.

All trading records were broken at the New York Stock Exchange last week. The sales of stocks for the week aggregated 4,319,751 shares, and bonds of the total par value of \$37,072,000 were dealt in. It was the biggest business week in Wall Street history.



# HEATING AND PLUMBING.

## Jersey City Master Plumbers.

A letter from Secretary M. P. Moran informs us that a meeting of the Jersey City Master Plumbers' Association was held Thursday, December 15, in Groeschel's Hall, Jersey City, and the following nominations made for the officers to be elected at the annual meeting to be held January 5, 1899:

*President*, J. S. McDonald.

*First Vice President*, T. H. Heatherton.

*Second Vice-President*, J. Donlon.

*Third Vice President*, T. Doran.

*Recording Secretary*, M. P. Moran.

*Financial Secretary*, J. Sprouls.

*Corresponding Secretary*, N. Waltherthum.

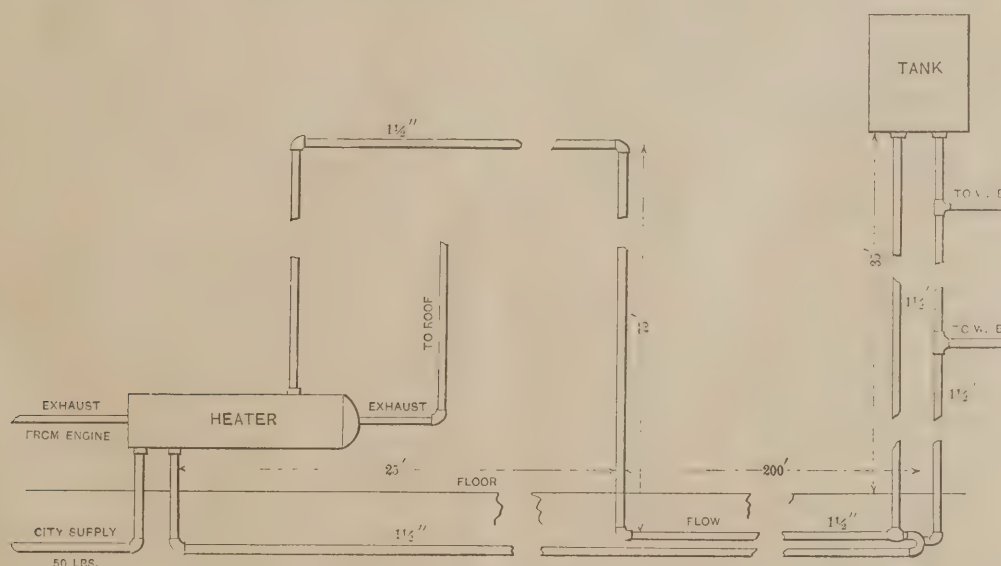
*Treasurer*, W. J. Cross.

*Sergeant-at-Arms*, J. Anderson.

*Trustees*, F. T. Kelaher, Thomas Cox and B. Kielt.

After the meeting adjourned the members met in the lower hall, where an enjoyable smoker was given, refresh-

50 pounds pressure on the cold water supply will be a help to the circulation in the trapped pipe system shown. The trap in the pipe is probably due to the heater being in one building and the fixtures to be supplied in another, and cannot be avoided readily. If this is the case an air valve of the positive type should be placed at the highest point in the trap, so that any air which may accumulate in use and in filling the system can escape. Owing to the distance of 200 feet or more which the water has to travel the pipe should be covered to prevent as far as possible the loss of heat. Asbestos paper may be used next to the pipe, then hair felt an inch thick covered with canvas, and if underground the whole should be protected by a wooden tube or by tile. The tank is doubtless for storing a supply of hot water and the intention is to keep up a circulation in the tank. The circulation would be better if the hot pipe connected on the side of the tank a few inches above the bottom. With a return bend where the flow and return connect, it is quite possible that cold water in the tank would hold the hot water, trying to rise to it, in check and establish a slow circuit. There seems



A Hot Water Supply System.

ments and supper being served and the evening spent in singing and story telling. Songs were rendered by Phil Heck, Joseph Harvey, with Frank Burke as pianist. Among those present were J. S. McDonald, T. Heatherton, J. Donlon, T. Doran, M. P. Moran, N. Waltherthum, J. Sprouls, W. J. Cross, J. Anderson, F. T. Kelaher, T. Cox, B. Kielt, A. Becker, J. Doran, H. Werner, T. Gearity, R. J. Coulson, C. Sulk, A. B. Dickson, W. Andre, J. Dodd and F. Ewald.

### A HOT WATER SUPPLY SYSTEM.

The apparatus and system of piping for utilizing exhaust steam to furnish a supply of hot water shown herewith is reproduced from a sketch sent to us by a correspondent who wishes to see the system discussed. Water can be heated by exhaust steam with advantage, providing the coils through which the steam passes do not create a friction or obstruct the flow to the extent of putting more than a few pounds back pressure on the engine. The heater should have coils presenting 1 square foot of surface to every 4 to 7 gallons of water the heater contains. Owing to the long travel the water will have to make and the heat that will be lost it will probably be better to expect to heat but 4 gallons with 1 foot of surface. The

to be no good reason why the return bend should not be omitted so as to secure a positive circulation, and the piping should be of one size throughout. It is probable that without a check valve on the return cold water might be drawn at the lower fixtures. Cold water could enter the heater, pass out the return and flow more easily along to the fixture than pass through the trap up to the tank and down to the fixture. A check valve would prevent this reverse action. If the heater is large enough for storing the hot water and a circulation is kept up in the pipes the use of the tank seems unnecessary.

### HUNTING, WEEKES & CORCORAN.

We have received from Hunting, Weekes & Corcoran, Watertown, N. Y., a budget of printed matter treating of the various lines which they handle. One is a catalogue of 48 pages devoted to modern sanitary fixtures. Several pages are devoted to the Jefferson siphon closets, the Saginaw wash down closet, the Dewey and the Noiseless closets made with low down flushing tanks. They also show the St. Lawrence, an enameled cast iron bathtub, followed by the Watertown, a steel clad copper lined tub, and the Competitor, which is said to be the cheapest sanitary bathtub made, being constructed of galvanized steel



and finished with a special enamel that is baked, giving a white, glossy, hard finish. The catalogue also shows lavatories, sinks, laundry trays, range boilers and plumbers' wood work. Another catalogue is devoted to stove trimmings, hollow ware, galvanized ware and sheet iron ware, showing coal hods, stove pipe and elbows, smoke and hot air dampers, stove boards, ash sieves, shovels, poker, lifters, steel hollow ware and spiders, sad irons, galvanized iron oil cans, fire buckets and water pails. The last pages are devoted to tinner's rivets, stove bolts, eave trough and conductor. They also send price-lists of extra large sizes of tin plate and also of their regular American roofing plates under the names Maple, Jefferson, Lewis Old Style and Garland New Method. This circular contains a table showing the cost of tin roofing with tin plates of different prices. They also send a circular devoted to maple sugar utensils, including sap spouts, sap buckets and syrup cans.

### CAPACITY OF ACETYLENE GENERATORS.

Those who have taken up the sale of acetylene gas generators will be interested in the method of determining their lighting capacity, given in a pamphlet entitled "Acetylene Gas for Popular Lighting," issued by the Pan American Acetylene Company, Buffalo, N. Y., which we reprint below:

In choosing a generator do not be befogged on the number of lights such an apparatus may be claimed to be sufficient for, but look to carbide capacity.

In our computation let us start with 1 pound of carbide; it yields nearly 5 cubic feet of gas. Now, as it takes  $\frac{1}{2}$  foot of gas each hour to supply one 24 candle power acetylene light, this pound of carbide is calculated by the manufacturers thereof to suffice for one such light about ten hours if an accurately gauged tip be used. Let us put it otherwise:

One pound carbide = nearly 5 feet of gas from such tip.

One-half foot of the gas = one 24-candle light for one hour.

Five feet of gas (about 1 pound carbide) = one 24-candle light ten hours.

Suppose, then, that the average house should use ten of these 24-candle lights for two hours daily the year round, that would be the equal of one such light for 20 hours and about 2 pounds of carbide would be used.

Taking the Standard Buffalo generator, which is recommended for all ordinary house lighting, its carbide capacity is 50 pounds. A smaller size holds 25 pounds. On the above basis one 50 pound charge of carbide should therefore last:

80 days for 3 lights of 2 hours daily,  
50 days for 5 lights of 2 hours daily,  
25 days for 10 lights of 2 hours daily,  
12 days for 20 lights of 2 hours daily,  
6 days for 40 lights of 2 hours daily,

and give equal satisfaction in each case. The use of a large generator is preferable in various ways, hence is always to be recommended.

The piping for common gas answers perfectly for acetylene. This is assuming that it does not leak, a matter most important in either case. Connect the generator service pipe with the pipes anywhere in the building, replace the old burner tips with the smaller acetylene ones and you are equipped for the new gas.

Where a house is not now piped for gas the putting in of new piping for acetylene is a trifling matter. Here again a point is scored for acetylene, because the smallness of the gas bulk used calls for pipes of smaller size than ordinary gas requires. In houses that are not fitted for gas the small pipes may be let into a groove cut into the plaster and afterward cementing over it with mortar or plaster paris or papering over it, with its presence hardly suspected.

The Rittinger-Rethy Company, 636 Columbus avenue, New York, manufacturers of the Rethy Sanitary Smoke Test Machine, report a growing trade for their apparatus. In use it is found to be simple in operation, quick to act and to do its work effectively. Another important thing about it is that it can readily be carried by a workman.

## Hot Water and Hot Air Heating Combined.—I.

Combination heating systems when correctly proportioned and installed have given very satisfactory service to their owners, and with a view to assisting those who wish to take up this branch of heating Isaac A. Sheppard & Co., Philadelphia, have given the following information, which we reprint from their copyrighted pamphlet "Hints About Heating:"

Difficulties often arise in properly distributing furnace heat in buildings in which a small number of rooms are too far distant from the furnace to be properly heated, or in which the carrying of horizontal hot air pipes through finished rooms is objectionable. To overcome such difficulties we manufacture a furnace with a water heating attachment by which these rooms can be heated without increasing the number of fires or using an additional furnace, or disfiguring finished rooms with large hot air pipes. As the problems involved are practically those involved in heating by hot water, it becomes necessary to present a few explanations and rules which are intended to be plain, simple and easily understood, without going too much into detail. In accomplishing this, several considerations require attention, namely:

### THE SUBJECTS FOR CONSIDERATION.

1.—*a* The use of the rooms, and the number of people who are to occupy them.

*b* The cubic contents, the exposure and the glass surface.

2.—*a* The kind of radiation, whether direct or indirect.

*b* The amount of radiation required.

*c* If indirect, the proper size of air ducts.

*d* The location and arrangement of radiators.

3.—*a* The arrangement of flow, return and draw off pipes.

*b* The proper size of same.

*c* The location of expansion tank with overflow and supply pipes for same.

4.—The proportion of water heating surface to the amount of radiating surface, and the size of hot air furnace required in connection with the hot water heating.

Taking these up in order, we consider *a* under the first subject.

### THE USE OF THE ROOMS AND NUMBER OF OCCUPANTS.

In an ordinary dwelling house there are two rooms that should be especially well provided with heat—the dining room and the bathroom. The dining room, in which persons first assemble in the morning, after the fire has run low during the night, should be so arranged as to be heated quickly and well, as breakfast in a cold, cheerless room is not conducive to a pleasant disposition during the remainder of the day. The bathroom requires much more heat in proportion to its size than other rooms, as it is generally a small room, and the smaller the room the larger must be the proportion of heating surface. Direct radiators are more comfortable in rooms of this kind; for a current of air from a register, even though quite warm, seems much cooler than it really is, especially if one is unclothed and wet. In ordinary living rooms it is sufficient both for proper heating and ventilation to change the air in the room twice per hour. In rooms in which large numbers of people congregate a proportionately larger supply of air is needed, but the volume of air delivered should be of a much lower temperature, as the heat radiated from each person, as well as that thrown off from the lungs, not only tends to vitiate the air, but so raises the temperature that in ordinary winter weather the bodily heat of the occupants will maintain the heat of the room, and the air supply should then only be heated sufficiently to take the chill off. Under *b* must be considered.

### THE CUBIC CONTENTS, EXPOSURE AND GLASS SURFACE.

These are the main factors to be considered when the rooms are used as living rooms, offices &c., to be occupied



by but few persons at the same time. Specially exposed rooms are those situated on the north or west side; as in the winter season they get little or no sun rays, and are exposed to the colder winds that force the heat from those rooms to the opposite side of the building; also corner rooms or others that have two or three outside exposures. Rooms with but one outside exposure are classed as ordinary rooms. On passing to the second subject *a* treats of

#### THE KIND OF RADIATION.

"Direct" and "indirect" are terms used to designate the location of radiating surfaces and the manner of supplying or conducting heat to the room. A "direct" radiator is one that is located within the room or space to be heated, communicating its heat directly to the air that is contained in the room.

An "indirect" radiator is one that is located at some point beneath the room to be heated, being incased in a galvanized iron casing or box to which fresh air is supplied, and from which the heated air thus supplied rises through suitably arranged ducts to the room that is to be warmed.

A radiator located within the room to be heated, that is supplied with external air in such a way as to heat it before it passes into the room, is called a "semi-direct" or "direct indirect" radiator. This style of radiator is growing in favor, as it combines the advantages both of direct and of indirect radiation. Under *b* must be considered the method of determining the

#### AMOUNT OF RADIATION REQUIRED.

Ordinarily, on account of the constant change of air, from 45 to 50 per cent. more of indirect radiating surface and about 30 per cent. more of "semi direct" radiating surface is required than of direct radiating surface to do the same amount of work.

For rooms of ordinary exposure—i.e., with but one side exposed to the outer air, and an ordinary amount of glass surface—a proportion of 3 square feet of direct hot water radiating surface per 100 cubic feet of space is a very fair standard; for exposed rooms, from 4 to  $4\frac{1}{2}$  square feet, according to the degree of exposure; in determining which good judgment must be used, as no "hard and fast rule" will strictly apply to all cases. Upon this basis we may compute as follows:

| Contents of room.  | Direct radiation for ordinary exposure. | Direct radiation for special exposure. |
|--------------------|---|--|
| 1,000 cubic feet.  | 30 square feet.                         | 40 to 45 square feet.                  |
| 1,500 cubic feet.  | 45 square feet.                         | 60 to 67 square feet.                  |
| 2,000 cubic feet.  | 60 square feet.                         | 80 to 90 square feet.                  |
| 2,500 cubic feet.  | 75 square feet.                         | 100 to 112 square feet.                |
| 5,000 cubic feet.  | 150 square feet.                        | 200 to 225 square feet.                |
| 10,000 cubic feet. | 300 square feet.                        | 400 to 450 square feet.                |

#### COMPUTING DIRECT-INDIRECT AND INDIRECT RADIATION.

Having proportioned the amount of direct radiation required, add thereto 30 per cent. of radiation, if semi-direct or "direct indirect" radiation is to be employed. If the full indirect system is to be employed, add 50 per cent.

To illustrate: A room 12 feet wide, 15 feet long and 10 feet high, containing 1800 feet, if of ordinary exposure, will require 54 feet of direct radiating surface; of semi-direct radiation, 30 per cent. more, or  $70\frac{2}{3}$  square feet; or of indirect radiation, 50 per cent. more, or 81 square feet. A room of the same size, specially exposed, will require from 72 to 81 square feet of radiating surface; from  $93\frac{2}{3}$  to  $105\frac{2}{3}$  square feet of semi direct radiation; or from 108 to  $121\frac{1}{2}$  square feet of indirect radiation.

The following is also a convenient working formula for computing hot water radiation:

1. Divide cubic feet of air in room by 75.
2. Add to quotient the actual square feet of glass in room, measuring between casings.
3. Divide square feet of exposed wall by 10, if wall is from 8 inches to 13 inches thick, or by 15 if wall is more than 13 inches in thickness, and add the quotient to the above sum.
4. Multiply the sum total by 0.70 if for direct radiation, by 0.95 for semi-direct radiation, or by 1.05 for indirect radiation.

For example: A room 10 x 20 x 10 feet is exposed on two sides, has three windows each 3 x 5 feet, and wall 8 inches thick. To find the radiation required:

$$\begin{array}{rcl}
 10 \times 20 \times 10 & = & 2,000 \text{ cubic feet} + 75 = 26.6 \\
 \text{Three windows each } 3 \times 5 & = & 45 \text{ square feet glass } 45.0 \\
 30 \text{ lineal feet wall } \times 10 \text{ feet in height} & = & 300 \text{ square feet.} \\
 \text{Less glass surface} & & 45 \\
 \hline
 & & 255 \quad + \quad 10 \quad = \quad 26.5 \\
 & & \text{Total,} \quad \quad \quad 97.1 \\
 97.1 \times 0.70 & = & 67.9 \text{ square feet direct radiation.} \\
 97.1 \times 0.95 & = & 92.2 \text{ square feet semi-direct radiation.} \\
 97.1 \times 1.05 & = & 101.9 \text{ square feet indirect radiation.}
 \end{array}$$

Under *c* information is given as to

#### THE PROPER SIZE OF AIR DUCTS

when indirect radiation is used. These should be proportioned in accordance with the purposes for which the several rooms are intended to be used. Rooms on the first floor require larger ducts than those located on upper floors, as the greater the vertical height of the air duct the greater will be the velocity of the flow of air through the duct. For an ordinary living room, as has been said before, it is sufficient for both heat and ventilation if the warm air supply is large enough in volume to change completely the air in the room every 30 minutes. The air in a crowded room, however, should be changed every 15 minutes; the volume of air thus supplied being at a lower temperature, as previously stated. Elaborate calculations as to the volume of fresh air required per occupant in crowded rooms are unnecessary here; inasmuch as there is great difference of opinion among competent authorities upon this point, and it is practically impossible to change the air completely, in any large room, oftener than once in 15 minutes without forced ventilation.

#### THE VELOCITY OF WARM AIR

in a vertical duct varies with the height of the duct and the difference between the external temperature and that of the air in the flue. For practical purposes, under average conditions, a duct 144 square inches in sectional area will deliver 10,000 cubic feet per hour to a room on the first floor; while one of 120 square inches sectional area will readily deliver the same quantity per hour to the second floor, and one of 96 square inches sectional area to the third floor, of a building of ordinary height. Thus, if a crowded room is to be heated, having a capacity of 10,000 cubic feet, the air in the room should be changed four times per hour, and the combined sectional area of all hot air ducts leading to it from indirect radiators should be  $144 \times 4 = 576$  square inches if the room is on the first floor;  $120 \times 4 = 480$  square inches if on the second floor; or  $96 \times 4 = 384$  square inches if on the third floor. If the room is occupied simply for ordinary living purposes one-half this flue area will suffice. This simple formula will furnish a ready means of calculating the sectional area of any warm air ducts under average conditions.

#### THE COLD AIR SUPPLY DUCTS

should be of not less than three-fourths the area of the exit or vent ducts for the reason that when the full volume of air is admitted it is but slightly heated, or, as heretofore expressed, "the chill taken off." Mistakes are often made in not making the fresh air supply to indirect radiators large enough. The supply ducts are calculated upon the basis of a quiet or still air, the movement of the air being caused by the heat of the furnace. The air can be called quiet when moving not over 1 mile per hour, or about  $1\frac{1}{2}$  feet per second, which is called an "imperceptible breeze;" and this condition often occurs in clear, cold weather. When the air is still all cold air ducts should be fully opened. When the wind is blowing at the rate of 6 miles or upward per hour, directly in the cold air duct, the supply of air to the radiators should be regulated by means of a properly fitted damper, which should always be so placed in every cold air supply duct as to be conveniently reached. *d* treats of the

#### LOCATION AND ARRANGEMENT OF RADIATORS.

Direct radiators should be placed in or as near to the colder parts of the room as possible. Semi-direct radiators are preferably located next the outer wall, under the



windows, so that fresh air can easily be conveyed to them. Indirect radiators should be placed as near the uptake, or vertical flue, as possible. If more than one uptake is arranged from a stack of indirect radiators the stack should occupy a position as nearly as possible central between the flues, giving preference, however, to the flues that are nearer the prevailing cold winds; it being remembered that the tendency of air in the rooms is in the same direction as on the outside, and that when a strong wind prevails it is difficult to carry the hot air against the wind much more than 12 feet horizontally.

(To be concluded.)

## New York Trade School's Eighteenth Season.

The formal opening of the day classes for the eighteenth season at the New York Trade School was held in the auditorium of the school, at Sixty-seventh street and First avenue, New York, on Monday afternoon, December 19. After extending a welcome to the classes, Superintendent H. V. Brill introduced R. Fulton Cutting, the president of the Board of Trustees, who was greeted with applause.

Mr. Cutting made a brief address, assuring the classes that he was glad to meet young men who had before them an opportunity to lay the foundation for their success in life. He advised them to take pains to learn all they could, and said that solid work would aid in getting the necessary information and skill to make their services as workmen in demand. With the acquisition of skill and knowledge he urged the building up of a character for careful and correct work and fair dealing.

Some excellent workmen, he pointed out, lack the character and reputation that is essential to hold a good position and to succeed in business. The school, he related, had been started to give young Americans the opportunity to learn a trade, but he doubted if it would have been begun had not the founder believed that the young men graduated from it would value their character higher than their skill and knowledge, and by their character reflect honor and credit on the school. Mr. Cutting then introduced William E. Dodge, a member of the Board of Trustees.

In his address Mr. Dodge expressed his pleasure in recognizing the pluck and grit necessary to leave home and friends to master a trade and become a useful man. Such men are wanted in this country, he believed, and cautioned them against the large crowd of people in a city like New York, who would endeavor to make money by trying to tempt them with wicked entertainments. Use the grit and pluck that brought you here, he advised, to accomplish your purpose, and leave such people alone.

Character, constitution and value as workmen would be improved by such a course as he pointed out, and recommended that they become so attached to their tools that they would love them as an angler his rod or a hunter his rifle. He closed by stating that money was not the most desirable thing to be had, but that knowledge and skill, with a sterling character, made a man enviable.

The day class in plumbing this year consists of 91 members, coming from 17 different States, Canada and Newfoundland, as shown by the list below:

### DAY PLUMBING CLASS, SEASON 1898-99

- Armstrong, Chas. L., 13½ Maple street, Auburn, N. Y.  
 Atwater, John S., 11 Park avenue, Auburn, N. Y.  
 Avery, Chas. C., 83 Elm street, Bradford, Pa.  
 Barton, Arthur C., Cornwall-on-Hudson, N. Y.  
 Beagle, Robert J., Hancock, N. Y.  
 Billings, Andrew W., 10 Riverview place, Yonkers, N. Y.  
 Bowers, Leroy L., Horseheads, N. Y.  
 Brein, Nathaniel C., 103 Eldridge street, New York City.  
 Brenner, Wm. H. C., 13 South Bridge street, Poughkeepsie, N. Y.  
 Brent, Ralph E., 1038 Eighteenth street N. W., Washington, D. C.  
 Brock, Lisle G., Moundsville, W. Va.  
 Chandler, Byron A., Decorah, Iowa.  
 Cleland, Edward S., Meaford, Ontario, Canada.  
 Crutch, George, Litchfield, Conn.  
 Daniels, Harold F., Lenox, Mass.  
 Day, George W., 24 Warren street, West Medford, Mass.  
 Decker, William N., 1128 Fulton street, Brooklyn, N. Y.  
 Du Bois, John L., Northvale, N. J.  
 Dudley, Wm. J., Jr., 39 Midland avenue, Montclair, N. J.  
 Duncan, Andrew N., Collingwood, Ontario, Canada.  
 Fehr, Edward E., Spring Valley, Ill.  
 Fochtman, Fred A., Petoskey, Mich.  
 Friedrich, Geo. H. C., 1888 Bathgate avenue, New York City.  
 Furck, Chas. L., 111 First avenue, New York City.  
 Garside, Donald, 77 Weetamoe street, Fall River, Mass.  
 Gartner, Louis, 363 East Tenth street, New York City.  
 Gaughan, Thomas J., 30 South Wyoming street, Hazleton, Pa.  
 Gerry, Chas. H., Charlemon, Mass.  
 Gilbert, Frank W., Delhi, N. Y.  
 Gleason, Chas. E., Washington C. H., Ohio.  
 Gutzler, Harry F., Warren, Pa.  
 Heindel, Sixtus, Guttenberg P. O., N. J.  
 Henson, Claude H., 165 North Fifth street, Newark, N. J.  
 Hollerith, Geo. F. A., 424 East 118th street, New York City.  
 Hyde, D. W., Jr., Bennington, Vt.  
 Immich, Frank J., 32 Harrison street, Poughkeepsie, N. Y.  
 Kittelberger, Frank, Clearfield, Pa.  
 Kolter, Fred F., Wapakoneta, Ohio.  
 Krulish, George, 1293 Chisholme street, New York City.  
 Krumb, Adolph P., 745 East Tremont street, Stockton, Cal.  
 Kuhnle, Chas. K., Piedmont, W. Va.  
 Kuhns, Henry J., Paulton, Pa.  
 Kuldoshes, George C., Dunellen, N. J.  
 Lieber, Frank J., Hawley, Pa.  
 Lynch, James, Bellows Falls, Vt.  
 McMurtrie, Lester C., Belvidere, N. J.  
 Miller, Otto C., West Orange, N. J.  
 Monahan, John S., Rutland, Vt.  
 Murphy, Thomas J., Lewiston, Maine.  
 Nagengast, Joseph, Lindenhurst, L. I.  
 Nealey, Chestley E., 32 Oliver street, Boston, Mass.  
 Nelson, Ralph W., Newburyport, Mass.  
 Noble, Chas. W., Mifflintown, Pa.  
 Nokes, Fred A., East Pepperell, Mass.  
 Nolan, William J., 174 Palisade avenue, Yonkers, N. Y.  
 Oberender, John, 35 Perry street, New York City.  
 O'Brien, John J., 257 West Seventieth street, New York City.  
 O'Brien, Chas. D., Greenfield, Mass.  
 Osmun, Lewis E., Rockport, N. J.  
 Palmer, Willet S., Friendship, N. Y.  
 Parker, Lyle B., Dalton, Mass.  
 Pepinstall, Leo J., 4 Lawrence street, Rensselaer, N. Y.  
 Phillips, Chauncey C., Freehold, N. J.  
 Pritchard, Thomas, Lansford, Pa.  
 Remington, Harry, Saratoga Springs, N. Y.  
 Roberts, Harry B., Box 375, Tampa, Fla.  
 Rosenberg, Saul N., 1836 Lexington avenue, New York City.  
 Sanborn, Edgar W., Ashland, N. H.  
 Sanborn, Julius E., Lakeport, N. H.  
 Schilken, Edward J., 537 Carson street, Pittsburgh, Pa.  
 Scott, Geo. E., Manchester, Mass.  
 Scrimgeour, James, Pittston, Pa.  
 Sherwood, George, 532 Smith street, Peekskill, N. Y.  
 Smith, Arthur W., Channel, Newfoundland.  
 Smith, Wm. J., 1045 Trinity avenue, New York City.



Spinks, Windsor A., 1713 Twenty-third avenue, Meridian, Miss.  
 Storms, Henry, 315½ Fulton street, Union Hill, N. J.  
 Swick, William J., 93 Irving street, Lockport, N. Y.  
 Tears, Clarence M., Walden, N. Y.  
 Thieme, Edward F., 14 School street, South Hadley Falls, N. Y.  
 Thompson, Howard B., Ashland, N. H.  
 Vincent, Edwin J., Ravenna, N. Y.  
 Wall, Emil, 13 Harrison avenue, Brooklyn, N. Y.  
 Wanamaker, Seth, Ramsey's, N. J.  
 Watson, Robt. F., 2513 Cherry street, Port Huron, Mich.  
 Weidenbach, Albert, 116 East Broad street, Hazleton, Pa.  
 West, Clyde E., 624 Clifford street, Portsmouth, Va.  
 Wilcox, Thos. S., Jr., 116 B street, Chattanooga, Tenn.  
 Wismar, Carl W. G., 31 South Plain street, Ithaca, N. Y.  
 Ziegler, Chas. J., 25 Bond street, Fitchburg, Mass.

W. G. Scollay, Brooklyn, N. Y.  
 B. H. Carpenter, Wilkes-Barre, Pa.  
 John D. Hibbard, Chicago, Ill.  
 A. A. Cary, New York.  
 J. A. Connolly, New York.  
 Thomas Barwick, New York.  
 W. A. Russell, New York.

## COUNCIL.

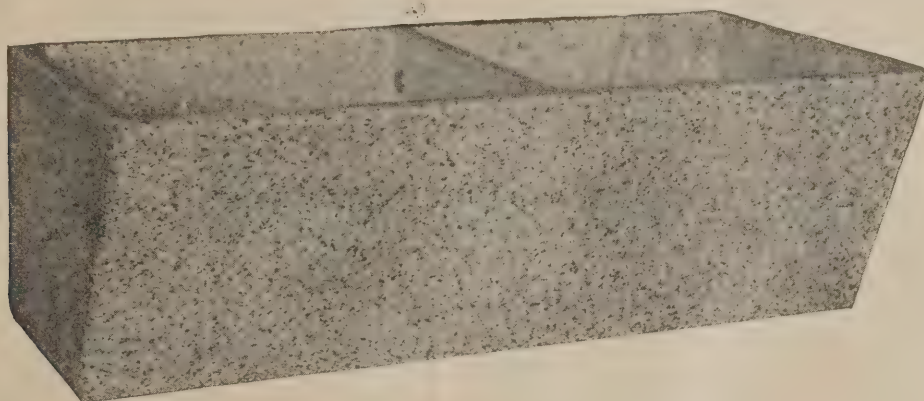
R. C. Carpenter, Ithaca, N. Y.  
 William McMannis, New York.  
 W. S. Hadaway, Jr., New York.  
 John Gormly, Philadelphia, Pa.  
 D. M. Nesbit, London, England.  
 W. H. Bryan, St. Louis, Mo.  
 B. F. Stangland, New York.  
 T. J. Waters, Chicago, Ill.  
 George Mehring, Chicago, Ill.  
 F. W. Foster, Boston, Mass.

## NOMINATIONS FOR OFFICERS FOR SOCIETY OF HEATING ENGINEERS.

The Nominating Committee of the American Society of Heating and Ventilating Engineers have made nominations for the officers to be elected at the annual meet-

## COMPOSITE TUBS AND SINKS.

In the accompanying illustration we show a two-compartment composite laundry tub made by the Murdock Parlor Grate Company, 156 Boylston street, Boston, Mass. The company make these tubs in one, two



*Composite Tubs and Sinks*

ing to be held at 12 West Thirty-first street, New York, January 24, 25 and 26. The Board of Managers held a regular meeting on Friday, December 16, to transact business and perfect arrangements for the annual meeting. The Council has had several papers presented and a number of applications for membership to act upon, and there is every indication that the next annual meeting will be of special interest.

### NOMINATIONS FOR OFFICERS FOR 1899.

#### PRESIDENT.

Henry Adams, Washington, D. C.  
 J. H. Kinealy, St. Louis, Mo.

#### FIRST VICE PRESIDENT.

D. M. Quay, Chicago, Ill.  
 H. D. Crane, Cincinnati, O.

#### SECOND VICE PRESIDENT.

A. E. Henrick, Brookline, Mass.  
 John A. Fish, Boston, Mass.

#### THIRD VICE-PRESIDENT.

F. A. Williams, New York.  
 A. C. Mott, Philadelphia, Pa.

#### SECRETARY.

W. M. Mackay, New York.  
 L. D. Sherman, New York.

#### TREASURER.

Judson A. Goodrich, New York.  
 J. J. Blackmore, New York.

#### BOARD OF MANAGERS.

W. F. Wolfe, New York.  
 S. A. Jellett, New York.  
 Henry C. Meyer, Jr., New York.

and three compartment sizes, and also a line of kitchen and pantry sinks. They are made of a composition of marble and Portland cement, without joints, obviating the possibility of leaking, and giving an article that is claimed to be practically indestructible and also impervious to water. These tubs will not become soaked with soapy water and cannot become offensive after use. The bottom is made with a pitch to the outlet, giving a quick flushing outflow, and the corners being made round cannot accumulate dirt. Another important feature is the overflow, which prevents damage when the water is carelessly left running. The material is hard and not affected by wringer screws.

## AMERICAN POTTERY COMPANY.

The work of completing the details of the combination of the pottery companies of the United States, to be known as the American Pottery Company, with a capital of \$27,000,000, is expected to be finished next week in New York City. It is said that the central office will probably be located in New York City, with branches at Trenton, N. J.; Pittsburgh, Pa., and East Liverpool, Ohio. The statement is made semi-officially that prices will not be advanced, as present prices are perfectly satisfactory, but that greater profits can be secured by concentration of effort and by economy in the cost of manufacture and distribution.

A letter from R. T. Connell of the R. T. Connell Plumbing & Heating Company, St. Joseph, Mo., informs us that he has about completed arrangements to open up a supply house at Kansas City, Mo., on February 1, 1899, and intends to carry a full line of Plumbers' and Steam Fitters' Supplies.



### GRAY'S WATER BACK FERRULE.

In the accompanying illustration we show a new brass water back ferrule that is being put on the market by James Gray, East Albany, N. Y. Having found difficulty in disconnecting the nipples used in water back connections, particularly where the water was impregnated with alkali, Mr. Gray devised a method and is taking out a patent for casting a brass ferrule in the water back which under corrosion does not unite with iron and enables the disconnection to be readily effected. He further states that his ferrule makes a clean full brass rustless joint, with full threads, that insure a water tight connection and yet can be disconnected with ease. In the broken view it will be seen that the ferrule has a collar around it to hold it firmly in place. The collar is also recessed to aid in making the joint with the iron tight. Mr. Gray states



*Gray's Water Back Ferrule.*

that he has patterns and can furnish water backs with his ferrule adapted for use in a large number of the modern angles.

### MUST HAVE SMOKE TEST MACHINES.

The ease with which the vent, waste, soil and drain pipes of a building can be tested with a smoke test machine and the certainty with which a leak may be located is the explanation of the increasing use of these machines. A substantial recognition of their excellence is made by the Board of Health of Erie, Pa., in adopting a recommendation of Plumbing Inspector Henderson of that city, to go into effect April, 1, 1899, whereby each master plumber must provide a smoke test machine for making the tests of plumbing work required by the board. This move no doubt will please the manufacturers of such machines. Those who have been making smoke tests say that a test can be made in much less time than was required by the tests previously used and the result is much more satisfactory, for, in addition to the pungent odor of the smoke, it can be seen puffing from small cracks that would be located with difficulty in either an air or peppermint test. A smoke test can be made either from the fresh air inlet or from the soil or vent stack on the roof equally well, and when all the fixtures are in use, without disturbing the trap seal. This makes the smoke test especially well adapted for old systems in use, as its application does not inconvenience the occupants of the building. The smoke test has long been popular with some plumbers, but its recent further advance in popularity is due to great improvement in the apparatus under the developing hand of the American inventive genius. Those machines most in favor are of a size that a workman can easily carry, with all of the necessary material for making the test, and which are simple in construction and readily manipulated.

A writer on acetylene gas in a Western paper, after pointing out the necessity of keeping the carbide in receptacles which will effectually prevent water from coming in contact with it, states that the apparatus is simple and harmless if used according to directions; that the gas illuminates brilliantly and is cheap, a pound of carbide costing 5 cents, which can be generated into 5 cubic feet of acetylene gas with an illuminating capacity equal to 65 feet of common city gas or two quarts of kerosene oil. It is also pointed out that to make one ton of calcium carbide it requires one ton of lime and 1200 pounds of coke dust. It is stated that in Illinois there are 200 farm houses that are illuminated with acetylene gas.

### The Bathtub Market.

The bathtub manufacturers of the United States held a meeting at the Hotel Iroquois, Buffalo, N. Y., Wednesday of this week, for the purpose of arranging an association. We understand that at the meeting the general terms were agreed to and the association was practically completed, the details of management only remaining to be considered. This action is in line with the reported pooling of the porcelain lined bathtub manufacturers and an allotment for production said to have been agreed upon.

Heretofore the manufacturers of tubs in which sheet metal was used have not been able to arrange their differences so as to be mutually satisfactory, and consequently any agreement reached at this meeting must be tested in the market before its value is established. However, all indications point to a higher range of prices for all kinds of bathtubs, and it is probable that those who order and have enameled tubs shipped before January 1 will anticipate an advance market.

### PENNSYLVANIA ASSOCIATION OF MASTER PLUMBERS.

We have received from Secretary Joseph A. Weldon, 305 Wood street, Pittsburgh, the following letter which President Frank P. Blythe has sent under the date of December 20 to the master plumbers members of the Pennsylvania State Association:

"Owing to the national convention in New Orleans having been called for March 8, 9, 10, it has been deemed advisable to convene our State organization at Scranton on February 14, 1899. While this may seem early, we must never forget our obedience to the interests and wishes of the parent body. Accordingly all delegates should be elected at once, and members not attached to locals should likewise prepare to attend. Notify the secretary as soon as possible of the names of your delegates. Select your best men and send the full quota. Wisdom, good cheer and healthy enthusiasm come from a multitude of counselors. Stir up the proud spirit of the Keystone State in your locality and go to Scranton in force. The glad hands of our Scranton brothers are already outstretched. They have assured us of a hearty welcome. Railroad rates will be secured if possible. You will be advised in due time of all incidental arrangements. In order to correct any misunderstanding the per capita tax for the year 1899 is now due and must necessarily be paid before the day of convention to entitle delegates to seats.

### NOTES.

The invitation to consider plans for the consolidation of the interests of boiler and radiator manufacturers has led some to reply with a valuation on their plants, and it is stated that answers have been received from a percentage covering considerably more than half of the trade.

A 78-page catalogue, bound in a brown cover, is received from the Lord & Burnham Company, 160 Fifth avenue, New York, devoted to greenhouse heating and ventilating apparatus. Half-tone engravings are shown of their Standard and Sectional Boilers adapted for hot water heating. Illustrations are also given of a variety of Cast Iron Pipe Fittings and Valves used in greenhouse heating. A large part of the catalogue is devoted to greenhouse constructive materials and to reproduction of autograph testimonial letters.

In a new generator for acetylene gas the carbide is in the form of a powder and is sprinkled on the surface of the water through an automatic valve, which is regulated by the pressure of the gas, the generating process being stopped immediately when the pressure rises too high.

The Advance Water Heater Company of St. Louis, Mo., have been incorporated with a capital of \$5000 to manufacture Water Heaters, by I. E. Reis, Sol Hammer and W. P. Kennedy of St. Louis and B. Robinson of Murphysboro, Ill.

Referring to the recently published amusing experience of a steam heating establishment in having the



boiler on their own premises fired up without its first examination to see if the water had been turned on, a prominent Chicago manufacturer of steam heating apparatus states that the experience is not really extraordinary. It is of course amusing to think that a concern should forget its own rules and injunctions to customers, but users of steam and hot water heating plants frequently start up such apparatus in the fall without filling the boilers with water. Several instances of this kind have occurred within his own experience this season. It is a matter which needs to be continually borne in mind when steam fitters are called upon to make repairs or to clean boilers in preparing for the approach of the heating season. They should impress constantly and persistently on their customers the necessity of having boilers supplied with water before they are started.

A letter from Clifford T. Schlemmer informs us that he will spend the holiday season at Cincinnati, the headquarters of the Schlemmer Company, makers of the O. S. Distributing Fitting and the Temple Vent Fittings. They have recently received a large order for their Specialties for foreign shipment. They report that these goods are becoming quite generally used.

Francis Bowes died at his residence, 812 Washington street, Hoboken, N. J., on December 17, from pneumonia, at the age of 50 years. He was a member of the plumbing firm of Bowes Bros. He is survived by a widow and two sons.

Quinlan, Tuigg & Co., 26 Charlotte street, Utica, N. Y., have recently completed plumbing a large livery stable for Mr. Barney, the stable occupying a ground space of 50 x 202 feet. They made the connections with the water supply, put in the cast iron drains throughout the building, all the latest improvements for drainage having been used for the most perfect sanitary arrangements. All the drains empty into a manhole, so that all floating matter, such as straw or hay, can be readily gathered up. The water from the roof is carried by 8-inch pipes to the drains for flushing. The stable floor is made water proof, with gutters behind the horses fitted with bell trap cesspools. The barn is supplied with hot and cold water, with coils for heating and supplying the carriage wash room with hot water. The harness room and the stables to a certain extent are heated with hot water.

George V. Corsiglia, Greenfield, Mass., is heating the school at Long Corners with a Boynton Steam Heater.

A fire doing \$200 damage visited the plumbing shop of Green & Logan, Bridgeport, Conn., last week.

E. Keeler Company, Philadelphia, Pa., bid \$13,772 and secured the contract for heating the new Philadelphia County Insane Asylum; the plumbing contract was secured by L. W. Gould, Vineland, N. J., at \$5073.

Ray Holt and Charles Rose, Syracuse, N. Y., have taken out patents on their Acetylene Gas Generator. They have already set up two lighting plants, and are now at work on the piping for one in the new Methodist church.

Lamb & Ritchie, Cambridgeport, Mass., the well-known manufacturers of Sheet Metal Pipe, are putting up a new building, which will be ready for occupancy in the beginning of 1899, when they will begin the manufacture of Composite Pipe, a newly patented article, consisting of the ordinary merchant wrought iron pipe, with which block tin is intimately united, so that, it is claimed, the two metals cannot be separated by mechanical force or heat or cold. The pipe is thus coated on the inside and outside. They are intended as a conduit for giving an absolutely pure water supply. Fittings will also be made to correspond with the pipe.

It is very often true that size and quality vary inversely—the greater the size the poorer the quality and *vice versa*. It has remained for the International Heater Company, Utica, N. Y., to present a notable exception in a poster that they have issued to the trade, which is a publication measuring 3½ feet by 28 inches, and carrying engravings of some of the heating apparatus they manufacture. Across the top of this poster, which is printed on heavy card paper, is the announcement, "Largest Makers of Heaters in the World." The illustrations show the Carton B Water and Steam Boilers, Palace Queen, Palace Regent, Carton A, Carton C, Carton D, Syracuse and Pease Economy Steam and Hot Water Heaters. The illustrations present general, sectional and detailed views of the apparatus noted, and are of a remarkably fine grade of execution; so that pictures of these apparatus, though printed merely in black and white, are very attractive objects for the eye to rest upon. The poster will find a welcome place on the wall in many establishments, and it will also be

much appreciated by architects, who can satisfy their own curiosity concerning the chief constructive features of these Boilers, and at the same time can point out to their customers, with the aid of these illustrations, the various Boilers from which selection can be made.

James Cleland, Meaford, Ontario, Canada, spent a few days in New York this week, having come with two young men—his son and Andrew N. Duncan—who entered the day plumbing class at the New York Trade School.

W. & B. Douglas, Middletown, Conn., have lately completed two handsome brass Pumps for use on the new battle ship "Illinois." The firm are now running their plant on regular time.

L. M. Edwards of Sayville, Long Island, N. Y., recently put in an acetylene gas generator for the purpose of lighting his stove, tin and plumbing store, a method of lighting which is becoming quite popular in that vicinity.

M. E. Shannon, Bath, N. Y., is installing in his new business block two No. 100 Standard Sectional Steam Boilers, manufactured by Giblin & Co., Utica, N. Y.

The Howard Automatic Draft Regulator, made by the Howard Thermostat Company, Oswego, N. Y., is the subject of a little circular issued by the company, in which they illustrate the device and give a quotation from an article on French methods of heating, in which the author admits the superiority of regulating combustion by the smoke flue instead of the pit door.

J. C. Spielman, Greencastle, Pa., has secured the contract for heating the Crowell House, and will install a hot water system, using a No. 57 Royal Boiler and 1800 feet of Triton and Chautauqua radiation.

Henri D. Dickinson, sanitary engineer, 3 Union Square, New York, has been retained by the Board of Education of Jersey City, N. J., to prepare plans and specifications for putting School No. 12 in a perfect sanitary condition.

W. M. Mackay, 235 Water street, New York, has been making a tour among the Southern trade in the interest of the Royal Steam and Hot Water Heaters made by the Hart & Crouse Company, Utica, N. Y. He reports business good among the contractors and the outlook for the coming year very promising.

The Board of Plumbing Examiners of Houston, Tex., composed of W. W. Otter, John McNeely, W. H. Smith, I. Austin Miller, Dr. R. T. Morris and Charles A. Reinecke, plumbing inspector, held a session at the City Hall December 15 for the purpose of passing on the qualifications of applicants for licenses as plumbers, in accordance with a State law. The following applicants passed satisfactory examinations: George Branard, William Reinecke, J. B. Collins, H. Kessler, John Gonzales, L. F. Delesdenier, C. Corn, Louis Tips, D. Collins, J. H. Smith. Messrs Reinecke and Collins are entitled to the grade of master plumbers and the others to the grade of journeymen.

George W. Clarke, who has been the heating and ventilating engineer for the Hunt & Connell Company, Scranton, Pa., for some time recently, resigned to accept a position with C. S. Scott & Co. of the same city. Owing to the many kindnesses shown to the employees of his department, Mr. Clarke was surprised at his residence, 317 Madison avenue, last week by a visit from them. The object of their visit was to present to him a gold watch, with chain and charm, bearing the inscription, "Presented to George W. Clarke by his workmen, 12-15-98." The presentation speech was made by Henry J. Hart, and Mr. Clarke accepted the gift in a few well chosen remarks, after which the evening was spent in social enjoyment, R. J. Thomas singing some favorite songs. After refreshments were served the departing guests tendered their good wishes to Mr. Clarke in his new business connection.

John D. Burleigh & Co., Worcester, Mass., have just installed in the greenhouses of Mrs. A. L. Converse, Webster, Mass., one No. 50 and one No. 60 Standard Sectional Hot Water Boiler, manufactured by Giblin & Co., Utica, N. Y.

E. C. Stearns, a graduate of the day plumbing class of the New York Trade School, is opening a plumbing establishment in Leicester, Mass., which is a branch of the Great Eastern Enterprise Plumbing Company.

The Kelly & Jones Company, Greensburg, Pa., manufacturers of Brass and Iron Tubular Goods for water, gas and steam, are running their works to utmost capacity in all departments and giving employment to about 500 hands. The business of this concern for this year has been much larger than for any previous year in their history.



The J. & B. Hunt Company, Tacoma, Wash., have built an automatic gas generator to be used in the club house of George Rice at Skagaway. The machine has a capacity for 125 lights. The generator is 50 inches in diameter, 56 inches high and is made of galvanized iron weighing complete 250 pounds. It is made to generate acetylene gas.

Edward Fitz Randolph, for many years treasurer of the Bradstreet Company of New York City and a member of the brass firm of Randolph & Clowes of Waterbury, Conn., died on December 18, in New York City, of pneumonia, aged 69 years.

A circular issued by the Crosby Steam Valve & Gate Company of Boston, Mass. with New York office at 78 John street, gives general and sectional views of the Crosby Spring Seat Globe and Angle Valve, a feature of which is that all the working parts are renewable without removal from the piping.

Sealed proposals will be received at the office of the Supervising Architect, Washington, D. C., until January 19 for the steam heating and ventilating apparatus for the United States Post Office Building at Akron Ohio. Bids will also be received up to the same date for similar heating apparatus for the United States Post Office Building at Pottsville, Pa.

Vice President Frank McLain of the J. H. McLain Company, Canton, Ohio, will spend the Christmas holidays at his old home in Canton, having arranged things at the New York office, 83 Centre street, for that purpose.

The Pierce, Butler & Pierce Mfg Company, Syracuse and New York, send Christmas greeting to the trade in a script engraved letter, inclosing with it a Christmas gift, which is a plated pencil bearing their name, and which also is graduated as a 6 inch rule. The letter expresses the hope that the pencil will aid in figuring a satisfactory profit on the past year's business and wishing the trade a happy and prosperous New Year. A slip is inclosed stating that the New York office will be moved January 1 to 46 and 48 East Twentieth street.

F. E. Phelps, who is well known in the heating trade as a representative of Fred D. Johnson, 80 Centre street, New York, will spend the holiday season in Washington, D. C., his former home.

The many friends of O. H. Phelps in the heating trade will after January 1 receive calls from him in the interest of the Capitol and Mascot Steam and Hot Water Heaters, as he has engaged with the United States Heater Company, Detroit, and will travel from the New York office, 127 Worth street.

#### New Firms and Changes.

Articles of incorporation for the Montana Heating and Ventilating Company, Butte, Mont., have been filed with the county clerk and recorder. The capital stock is placed at \$50,000. The incorporators are H. L. Frank, Charles Suiter and John E. Rickards of Butte, and George L. Ramsey and Jacob Switzer of Helena.

Staples Bros., Haverhill, Mass., have moved their plumbing shop to 167 Washington street.

The Jennison Plumbing Company, Fitchburg, Mass., are building an extension to their plumbing shop 26 x 40 feet.

The Spokane Gas Machine Mfg. Company, Seattle, Wash., with a stock of \$50,000, have been incorporated by G. B. Dennis, F. L. Kershaw, W. B. Dennis and Adrian G. Hanauer, for the manufacture of acetylene gas and operation of plants.

The Standard Gas Machine Company have been reorganized in New Haven, with Israel Kelsey as president and Charles E. Graham as secretary and treasurer. They are now perfecting a new and economical gas machine, which they expect to have on the market in a short time.

The Doyle Mfg. Company have been incorporated under the laws of New Jersey, with a capital stock of \$50,000, by William H. Doyle and William McCoach of Philadelphia and John F. Sweeney of Camden, to manufacture and trade in Plumbing Tools and Supplies in Philadelphia.

The Nebraska Plumbing & Heating Company of Omaha, Neb., have been incorporated, with a capital of \$5000, by H. C. Gradwohl, J. F. Meagher and D. L. Rogers, to do a plumbing, heating and gas fitting business.

The New York headquarters of the Monash Younker Company of Chicago will be moved to 43 Centre street January 1, where they will display their line of Steam Specialties and Air Valves, and the Star System of Plumbing Fixtures for connecting lead pipe without the use of solder.

Andrews Bros. will move to 87 Centre street, New York, January 1, and will continue to carry a line of Steam Pipe and Boiler Covering Material, and will be prepared to meet the requirements of the trade promptly.

Thomas F. Willenbecher and Archibald E. Haines started in the plumbing business at 28 South Seventh street, Allentown, Pa., on December 12. Mr. Willenbecher was employed for 12 years with Shafer & Willenbecher Bros. and Mr. Haines was with the same firm for seven years. They will engage in plumbing, gas and steam fitting, and deal in Gas and Electric Fixtures, Hydrants, Pumps, Bathtubs, &c.

The Bronx Granite Company of New York City have been incorporated to manufacture Plumbers' Supplies. Capital \$10,000.

#### A Self Propelling Boat.

Some interesting particulars are furnished in *Pearson's Magazine* by Herbert C. Fyfe, the English yacht builder, of a novel boat that propels itself, and to which the inventor, Mr. Linden, of Naples, Italy, has given the name of the "Autonaut." Without the help of engines or steam or electricity or "man power," this curious vessel makes headway against wind and waves at a speed, it seems, of from three to four miles an hour. Singularly enough, too, the rougher the sea the faster she moves, the explanation being that she is propelled by the action of the waves. The secret of her propulsion lies in a couple of pieces of apparatus, not unlike grid-irons, fixed, one at the bow and the other at the stern, about level with the keel. These strips of steel are what the ingenious inventor calls "feathering fins," and it is stated that he was led to the discovery by closely observing the motion of fishes' fins, especially the dolphin's tail. In the case of the "Autonaut" these so-called "fins" are moved by the waves in one direction, and rebound back of their own elasticity. Hence, it is explained, no engines are required to propel the strange craft.

A factory for the manufacture of sash weights from tin scrap is to be established at West Middlesex, Pa. The contract for the greater part of the machinery has been placed with a Cleveland concern.

A bill has been prepared for introduction in the New York Legislature to compel the New York City gas companies to supply illuminating gas at 90 cents per 1000 feet hereafter, and fuel gas at 60 cents per 1000 feet. Two years ago the Legislature made a law to reduce the price of gas from \$1.25 to \$1 per 1000 feet by gradation; that is, the companies were to charge 5 cents less per 1000 feet every year until the price reached \$1. The present price is \$1.15, and on January 1 it will be \$1.10.

A new use for aluminum is being found in the manufacture of caps for glass fruit jars. Heretofore these caps have been made of sheet zinc. The Pittsburgh Reduction Company have made some large sales of sheet aluminum this season for this line of manufacture.

The Maine shipbuilding industry is experiencing an era of almost unexampled prosperity. Vessels launched this year in the district aggregate over \$30,000 tons. The Bath Iron Works, who have many contracts in hand, including several from the Navy Department, have begun to enlarge their plant in order to meet the demand for new vessels. There is an active demand for vessels for the West India trade, and a large number of coasters are to be built to take the place of those that were lost in the recent gales.

By his will the late Alfred Nobel, the Swedish dynamite manufacturer, left almost the whole of his fortune to be converted into an international fund for the advancement of scientific research. The bequest, however, was disputed by the relatives of the deceased, and litigation ensued. It is now announced that a compromise has been reached whereby the relatives receive about \$1,000,000 of the property, the balance, amounting to about \$7,000,000, being used as designated by Mr. Nobel. This will give, under the terms of the will, five prizes annually of about \$41,000 each to persons making the most important discoveries in physics, chemistry, physiology or medicine.



# THE RETAIL STORE.

## HARDWARE AND ELECTRICAL SUPPLIES.

In the following contribution to *The Iron Age* a Hardwareman tells of the advantage of handling electrical supplies in Hardware stores: The writer was for many years engaged in the Jobbing Hardware business as traveling salesman, and later as manager of an important department of a large jobbing house. Some time ago he engaged in the manufacture of electrical machinery, but, as an old Hardwareman, all matters pertaining to the welfare of the Hardware fraternity are deeply interesting. Since entering the electrical field he has been impressed with the unsatisfactory manner in which the electrical trade of the country is conducted in all places outside of the large cities. In the large cities (over 100,000 inhabitants) the electrical trade reaches a volume sufficient to support dealers handling nothing but electrical supplies, but the many smaller cities and towns with electric light plants cannot support separate dealers in this line. The consequence of this is that the electrical business is largely undeveloped outside of the large cities, for the reason that no one capable of handling the trade is at all interested in the matter.

### Great Possibilities.

The average electrical dealer in smaller places is either a young fellow fresh from school or college, who has picked up a smattering of electrical knowledge, and who, by reason of this, is looked upon by his associates as a budding genius, but who is absolutely destitute of business training or financial responsibility; or he is an electrical workman who has accumulated a little money and is equally without real business experience. It is, of course, impossible for such persons to handle any business with the greatest amount of success to themselves or satisfaction to their customers. Instead of being surprised that so many such people fail, the real wonder is that so many succeed; and the fact that many do succeed proves that the supply business has great possibilities for any man of business experience and sagacity who gives it the proper attention.

In many instances the electrical trade is handled by the

### Electric Light Stations,

but as they are interested only in such supplies as conduce to the extension of their own business, they develop the trade only to a very limited extent. An electric light station is not fitted for carrying on a trading business, and most of them would be only too glad to turn this business over to any dealer capable of taking care of it, and in addition would give this dealer all assistance and information in their power. Having outlined the present status of the electrical trade, the question naturally arises, What has all this to do with Hardware? It has everything to do with it, as the electrical supply business should, by every logical reason, be a branch of

### The Hardware Business.

The successful Hardware retailer must be a man of more than average intelligence and business ability, as he handles the most complicated and varied line of merchandise extant. He is familiar with machinery, and usually runs a tin shop or Bicycle repair shop in connection with his store. While the admission must be made that in manufacturing electrical apparatus a great deal of special technical knowledge is necessary, the selling of electrical supplies does not call for any more knowledge than any other line of merchandise,

and is, in reality, not nearly so complicated as many lines familiar to every Hardware dealer.

### The Way to Start

a successful business in this line is to employ some young man with a little electrical knowledge, let him attend to the electrical questions, having him under strict supervision to see that the business is handled on conservative lines. A good start can be made with a very small outlay—a few lamps of the style used by your electric light station, some lamp cord, sockets, switches, a few electric bells, batteries, &c., buying everything in small quantities and expanding the line as the growing business demands. The retail profit on almost all items is large, and in many other ways the electrical line works in well. In the fall and winter months the sale of incandescent lamps is large, and as these are continually being broken or burning out, this fact assures a steady business.

### Between Busy Seasons.

In the spring and summer months a large business can be worked up in fan motors, this line running rapidly into money with good profits at a time of year when the general Hardware trade is dull. The Hardwareman who has a bicycle repair shop is particularly fitted for electric wiring and simple repairing, as most of the troubles in common electrical apparatus are readily located and repaired by any one with ordinary mechanical ability. Most of these defects show up in the fall when people begin using lights extensively, and the busy season in electrical wiring and repairing is just when the Bicycle repair man is enjoying a period of leisure.

### A Timely Suggestion.

Most people look upon the electrical business as a matter entirely beyond them, but there is absolutely no reason for such a belief. There are probably a dozen good Hardware firms known to the writer who have taken up the electrical supply business in the last year, and they have without exception been successful and have largely increased the electrical business in their locality. It would not have been possible five years ago, or even two years ago, for the Hardwareman to enter on this line, as the manufacture of electrical appliances was largely in the experimental stage. The past two years, however, has practically standardized this line, experience and use have sifted the good from the bad, and there is no more danger of change in this line than in any other line familiar to the Hardware dealer.

### Guide to Buyers.

The National Board of Fire Underwriters issue free to any applicant a book called "National Electrical Code," giving the approved practice in all electrical matters. This, in connection with their "List of Electrical Fittings," will prove a sure guide to the buyer until he can rely upon his own judgment. The difficulty the retail buyer will first experience is to find out where he can buy these various articles to best advantage, and this brings up the point that the present electrical supply jobber must change his methods of doing business in some ways if he is to hold the trade when it drifts to the Hardware dealer, as it undoubtedly will in time.

### Distribution of Electrical Supplies.

The electrical supply jobber cannot cover any given territory as often or as thoroughly as is desirable, owing to the fact that the entire selling expense falls upon one



line of merchandise. For the next few years it will probably be the larger Hardware dealers who will develop the necessary energy and enterprise to embark in this field, and by that time the electrical supply houses may have grown to a degree enabling them to cover the country approximately as frequently and thoroughly as it is now covered by the Hardware jobber.

#### A Profitable Line.

That the addition of electrical supplies by the retail Hardwareman would largely increase his sales and provide him with a new line of profitable merchandise at a time when the prices and profits of Hardware are lower than ever before known is an indisputable fact. The handling of this line by the Hardware retailer will place the electrical supply business in the hands of experienced business men, who are fully capable of taking care of the consumer, and who will at the same time command the confidence of the electrical jobber and manufacturer.

This is a condition that is longed for by all electrical jobbers and manufacturers, and would result in a development and expansion of the use of electrical supplies in the smaller cities and towns that is at present but dimly realized. It is impossible, at present, to foretell the exact manner through which the retail Hardwareman will procure his needs in this line, but, as in all other lines, we may rest assured that the trade will follow the path of least resistance, and the sources from which the retailer can obtain the most prompt and satisfactory service will obtain the lion's share of the trade.

#### Reaping the Benefit.

That there is certain to be some decided change in the method of handling this line of merchandise is obvious to any thinking man who is familiar with the situation. There is a growing feeling of unrest and dissatisfaction with prevailing methods that evidences itself most strongly in certain sections and under special conditions, and this will continue growing in strength until the natural and proper solution of the problem is gradually worked out. The developments to this end are being closely watched by the more progressive firms interested in either of these important classes of trade, and the writer hopes that this article will be the means of bringing the matter to the attention of a large number of Hardwaremen, so that they may share, according to their opportunities and ability, in reaping the benefit from a line of trade that is adapted to their present business, and the opportunities of which are practically undeveloped and unlimited.

### THE KIECKHEFER PERFECT MADE UP MILK CANS.

In a little pamphlet entitled "An Interesting Story" Kieckhefer Bros. Company, Milwaukee, Wis., give the history of the Kieckhefer Perfect made up milk cans from the time they added this branch of the business three years ago.

On studying the necessary qualification they concluded that railroad milk cans capable of standing the hard usage could not be made in the ordinary shop from trimmings as well as they could be made in a plant equipped with special machinery for working the necessary heavy material and producing an improved article at a lower price to the trade. Under the head of improvements they claim their cans, with breast and body double seamed together, possess an important and unique element of strength, and that their improved bottom hoop, with offset supporting the bottom and body of the can, protecting both from injury, is another of their original ideas in can construction. By riveting the body, bottom and hoop securely together soldering is not depended upon to give strength, and this construction effects a great strength and durability. Another feature is the use of seamless necks and bowls. The Milwaukee R. R. milk can, which they first manufactured on a large scale in an original

way, has continued to hold a large trade. They have since added two lines, the Wisconsin R. R. milk can, which is a heavier can, and their New Elgin R. R. milk can, which they present to the trade, claiming that it is the best and heaviest can on the market.

For making cans they maintain a tinning department, and their process, they explain, serves the same purpose as welding, as the parts must be either melted or forced apart with tools to separate them. By using strictly first-class material in every part and countersunk rivets their cans are said to be as smooth inside and out as glass and as bright as a mirror. It is pointed out that such cans can be easily cleaned and no milk is spoiled because there is difficulty in properly cleaning them. The pamphlet shows these cans as trimmed for different markets and gives full particulars and prices. It also shows a variety of factory cans and a full line of creamery and dairy fixtures. A specialty is made of the Jersey combination pails having a detachable strainer, so that they can be nested to save space and also boxing and freight.

### THE FOSTER SAP SPOUT AND BIT.

The accompanying cuts relate to a sap spout, bit and rosser offered by H. H. Foster, Cabot, Vt. The spout is referred to as convenient for use and as one that

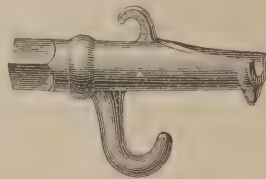


Fig. 1.—The Foster Sap Spout.

will not leak, break or pull out. It is provided on the top with a hook to allow a tin or wooden cover being put on the bucket to keep out dirt and storm. The hook on the under side of the spout is for attaching the bucket. The spout is shown in use in Fig. 2. Attached



Fig. 2.—Foster Spout and Cover.

to the bit in Fig. 3 is shown a rosser that gauges the depth of hole and removes any coarse, loose bark, obviating the use of a hatchet, which is apt to injure the trees. The spout and bit, it is remarked, are the result

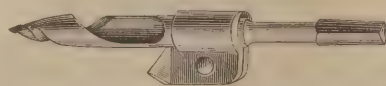


Fig. 3.—Improved Bit and Rosser.

of fifty years' experience in sugar camps. The spouts are furnished tinned, galvanized, oiled and japanned.

C. H. Hall, Juda, Wis., is putting in a stock of Hardware, Stoves, Implements, Sporting Goods, &c.



## H. HALLER MFG. COMPANY'S GOODS.

From the H. Haller Mfg. Company, Limited, manufacturers and jobbers of pieced, stamped and japanned tinware, enameled ware, stoves and general house furnishing goods, 627 and 629 Magazine street, New Orleans, La., we have received a copy of an illustrated catalogue and price list covering their various lines of tinware and house furnishing goods, together with price lists of cooking and heating stoves. The catalogue is of large size, with 30 pages profusely illustrated with cuts of a wide variety of goods, including pieced and stamped tinware, stove trimmings, stove hollow ware, stove pipe elbows and dampers, tinned, enameled and turned hollow ware, japanned tinware, sheet iron stove pans, coolers, enameled iron ware, galvanized iron ware, bathtubs, refrigerators, coal vases, stove boards, lamps, oil stoves and heaters and a large number of miscellaneous articles, such as coffee mills and roasters, sieves, cutlery, dish covers, oil cans, scales, coal hods, milk cans, metal toys, freezers, &c. The stove catalogue embraces 14 styles of cook stoves, including the Louisiana, for burning either coal or wood, and the Champion, Premium, Superb, Bonanza, Orleans and Diana, designed for wood burning only. Ten varieties of heating stoves are shown, including stoves for burning coal, combination coal or wood burners and sheet steel air tight wood heaters.

## THE FIGHT AGAINST EXCESSIVE EXPRESS CHARGES.

The campaign of the merchants of New York against the excessive express charges shippers are compelled to pay is being vigorously carried on. Printed matter which goes exhaustively into details has been mailed to 36,000 merchants and others in the State of New York. This is one of their methods of organizing public sentiment, by means of which cogent facts are presented in concrete form so that those interested may form an intelligent opinion of the indictment. To prepare the legal details the association has retained Joseph H. Choate as special counsel, in addition to the regular counsel of the organization, James B. Dill of Dill, Seymour & Baldwin.

## MEMORANDA.

A number of new forms of Lanterns for bicycle and other purposes are illustrated on circulars distributed by the Manhattan Brass Company, 338 East Twenty eighth street, New York City. A separate sheet gives illustration and a brief description of the Cadet Lantern, while other Bicycle Lanterns are the Brilliant and Gem for acetylene and the Front Light and Queen for kerosene. They also issue a circular of the Manhattan Smokeless Incandescent Lamp burning kerosene oil, for which many special merits are claimed.

Arcade Mfg. Company, Freeport Ill., have just purchased the business of the Warner Hardware Company of that city, consisting of the entire stock of material and manufactured goods, machinery, tools, patents, good will, &c. They are now transferring the effects to their factory and in a few days will be prepared to supply the trade with all the articles formerly made by the Warner Company. The addition of this line to their own will, it is remarked, give them a very large and desirable line of light hardware and patented household novelties. A new catalogue relating to their enlarged line of manufactures will be issued early in January. This new departure will necessitate the building of a large addition to their plant, and they are planning to build in the spring as soon as the weather will permit a substantial brick building, 120 x 50 feet, two stories high. This structure will be equipped with modern machinery and appliances, so that they will be in a position to render the trade excellent and prompt service.

The Stove store of George A. Sanders, deceased, Laconia, N. H., has resumed business under the management of his son, Frank Sanders.

Exum & Jones are successors to Montgomery & Exum, at Mobeetie, Texas. They have just completed their new store and wareroom, and refer to business as good and gradually increasing. They handle Shelf and Heavy Hardware, Stoves, Tinware, Implements, Sporting Goods, &c.

Forbes & Bro., Hopkinsville, Ky., are erecting a new storeroom adjoining their present establishment. The addition will front 60 feet on Main street, running back 120 feet. It will be thoroughly modern in all its arrangements. The firm, besides retelling hardware, Agricultural Implements, Buggies, Stoves, Bicycles and Sporting Goods, are also manufacturers of Wagons.

The Wenatchee Hardware Company, Wenatchee, Wash., have been incorporated with a capital of \$5000. They will continue the business formerly conducted by Geo. Kline, handling Shelf Hardware, Stoves, Tinware and Agricultural Implements.

F. E. Smith, Montrose, S. D., has opened up as a retailer of Shelf and Heavy Hardware, Stoves, Tinware, Sporting Goods, &c.

W. M. Glenn, Lufkin, Texas, has taken in a partner, and Glenn & King is now the style of the firm. A retail and wholesale business is done in Hardware, Stoves, Tinware, Implements, Sash, Doors, Blinds, Saddlery and Harness, &c.

Chapin & Rue have succeeded J. L. Collist, at Charlotte, Mich., in the wholesale and retail Hardware, House Furnishing and Sporting Goods business. The firm are improving the store, putting in new shelving, showcases, &c., thus adding materially to the attractiveness and convenience of the establishment.

Cooley & Ives, Kenney, Ill., have disposed of their line of Implements to P. Howard & Son, and will hereafter handle Hardware, Stoves, Tinware, Sporting Goods, &c., in addition to a line of furniture which they will take up January 1. They refer to trade as good, especially in the Stove line.

A. G. Evans has opened up a stock of Shelf and Heavy Hardware, Stoves and Tinware, at Alamogordo, N. M.

A. J. Liscomb and the Shaffer Hardware Company, Parsons, W. Va., have consolidated their stocks under the style of the Diamond Mercantile Company, wholesalers and retailers of Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Sporting Goods, &c. The company state that they have enlarged their store, doubling its capacity. They are looking forward to a gratifying business during the coming year.

C. E. Christensen has lately opened up in business, at Manti, Utah, under the style of the Manti Stove & Hardware Company. Mr. Christensen is carrying a varied line, including Hardware, Stoves, Tinware, Agricultural Implements, Sporting and Athletic Goods, &c. He refers to business as opening up in good shape.

Gruenhagen Brothers of 924 926 Raymond avenue, St. Anthony Park, Minn., state that their business for the past year was nearly one-third larger than for the corresponding 12 months. They have made a material change in their business lately, whereby they have taken the agency for the goods of a number of manufacturers, and carry stocks at their warehouse for North and South Dakota and Minnesota. This part of the business will be managed exclusively by W. H. Gruenhagen, and will be represented on the road by two experienced traveling men of the West who will cover the territory indicated above. The concern report the outlook for 1899 as very promising, but are of the opinion that prices will remain about as heretofore.

Referring to the item that has been lately traveling about the country concerning the sign in the possession of the Western Society of Engineers, on which the words "Harper's Ferry," painted in black, stand out in relief through the erosion of the surrounding wood, due to the fact that the black paint was more durable than the other paint on the sign, the Joseph Dixon Crucible Company, Jersey City, N. J., speak of the merits of graphite paint and quote William Hooper of Ticonderoga, N. Y. He says it is his belief that ground graphite mixed with pure linseed oil will prove the most durable of coverings, and mentions a case of a large iron casting which has been in his mill yard for over 30 years painted with a single coat of this paint. When the casting was broken up he said the paint looked quite fresh. He explains this on the ground that after the oil has disappeared the graphite adheres to the surface the same as the graphite in a lead pencil will adhere to the surface of paper.

\*State Geologist Blatchley of Indiana believes that the supply of natural gas in the Indiana field will not continue more than two or three years sufficient for the manufacturing situated in that region. He is of the opinion that the coal district in Western and Southwestern Indiana will become the manufacturing center of the State within a few years.



# TIN PLATES.

## THE TIN PLATE CONSOLIDATION.

Looking upon it simply as an achievement, the consolidation of the tin plate factories accomplished at Chicago last week is one of the most successful combinations ever attempted. It has gone far beyond what was deemed possible when the matter was first broached. The only establishments outside the pale are those consuming their own output in the manufacture of finished products, and it is not improbable that these could also have been included if it had been thought desirable. The great consolidation of wire manufacturers, known as the American Steel & Wire Company, was much more easy of accomplishment, and so was the union of interests now known as the Federal Steel Company. The harmonizing of such diverse spirits as those controlling the large tin plate establishments called for a masterful management of the rarest character. Credit is given to the Moore Brothers of Chicago and other attorneys, whose achievements of the same character in other industries had given them valuable experience available for such an undertaking as this. But they evidently received able assistance from such practical business men in the tin plate trade as D. G. Reid of the old American Tin Plate Company and F. S. Wheeler of the Great Western. Lawyers may plan and promoters may scheme, but the practical man who knows the peculiar details of a business is needed to steer through difficulties and avoid antagonisms in bringing the interests together.

Nothing so formidable as this consolidation exists in any other branch of the iron and steel trades. Other large aggregations of capital have competing with them enough important independent concerns to prevent absolute control of prices by one great company. The power held in this respect by the American Tin Plate Company is not yet fully appreciated in the trade. It is understood to some extent by the operators on the Chicago stock exchange, who are sending prices of the company's stock up rapidly, on the prospects of large net earnings. They cannot conceive why a company practically owning the tin plate capacity of the country and having no competition on their commercial product should not prove bewilderingly profitable to the stockholders. Extravagant reports are in circulation as to the probable earnings of the company and the certainty of regular dividends on the common stock as well as the preferred. These reports, perhaps, emanate from sources presumed to be well informed, but they thus far lack the official stamp.

What the policy of this great corporation will be remains to be seen. If a conservative policy is adopted, and prices are kept down to a low level, near that recently ruling, it is possible that the economies which can be instituted and the better methods of handling the trade which can be adopted may enable a satisfactory profit to be realized which will pay dividends and enable the company to retain indefinitely the control of the tin plate business now secured. But if prices are rapidly advanced, and greater profits are realized in that manner, it will not be long until competition springs up and the business of the country will again be divided among a number of manufacturers. Capital can always be found to venture into a business which promises profitable returns.—*The Iron Age*.

Speculation in the stock of the new Tin Plate Trust has been in full swing during the week, and large transactions in it have taken place in Chicago. Quotations have advanced 12 or 13 per cent. over the figures of a week ago, the stock closing at a premium of 40 per cent. above par.

## Tin Plate Imports.

The monthly summary of exports and imports for October, 1898, issued by the Treasury Bureau of Statistics, places the imports of tin and terne plates and taggers' tin into the United States during that month at 7,532,041 pounds, valued at \$170,585, as compared with 9,192,849 pounds, of the value of \$203,031, imported in October, 1897. The total tin plate imports into this country in the ten months ended October 31 last were 134,503,009 pounds, valued at \$3,966,738, as compared with 161,780,464 pounds, valued at \$3,798,743, imported in the corresponding period of 1897 and 241,617,383 pounds, of the value of \$5,565,925, in the first ten months of 1896. This gives about 1,245,000, 1,500,000 and 2,237,000 boxes of foreign plates entered for consumption in the three respective ten monthly periods, or a monthly average of 103,750 boxes in 1898, against 125,000 boxes in 1897 and 186,415 boxes in 1896.

Taking the latest official figures published by the British Board of Trade, we find that the exports of tin plates from Great Britain to the United States in the month of November, 1898, showed an increase of nearly 1500 tons over those of the previous month, being 5238 tons in November as against 3760 tons in October. In November, 1897, 5570 tons of British tin plates were shipped to this country. For the 11 months ended November 30, 1898, the total exports of tin plates from Great Britain to the United States amounted to 59,870 tons, as compared with 75,452 tons in the corresponding period of 1897 and 105,972 in the first 11 months of 1896. This shows about 1,257,250, 1,584,500 and 2,225,400 boxes of tin plate sent to this country from England in the three respective periods of 11 months, being equivalent to a monthly exportation of 104,770 boxes in 1898, 132,040 boxes in 1897 and 195,450 boxes in 1896. These averages, as compared with the ten-monthly figures given above, are brought up by increases in November shipments in each year. The steady decline shown in the totals for the past two years, however, is noticeable.

It is not likely that future returns will show any such striking decline. The imports of foreign tin plates have now gotten down to a point at which they are likely to remain for some time to come, for they represent little beyond the material brought in for the use of the exporting canned goods and oil trade, and which is re-exported as packages under benefit of the drawback.

## WELSH TIN PLATE TRADE IMPROVED.

The great loss to the Welsh tin plate trade of the bulk of their market in the United States seems to have been offset to a considerable extent of late by an increased demand for tin plates from other quarters. Never before has the British consumption of plates been so extensive, while the demand from the European Continent has steadily increased. Prices have advanced sharply in the meantime. The Welsh mills, too, have found what amounts to practically a new trade which has sprung into existence of late. Large quantities of black plates are now being shipped to European points. In connection with this new feature the *South Wales Daily News* says: "The great change in the trade is prominently brought to the eye of a visitor to the tin sheds at Swansea. But a short time ago an occasional parcel of boxed black plates might be seen, but now scores of tons of circles and black plates of all sizes lie there, waiting for shipment to Continental ports. These black plates are used for many purposes,



not a small quantity being consumed in making the enameled utensils now coming into such general use in this and other countries. The demand for the odd sized plates is constantly on the increase and the development in this direction is remarkable. One prominent manufacturer within the last fortnight has declined to quote prices for many orders offered, the full production of his mills being already well sold in advance."

## The Policy of the Tin Plate Trust.

The tin plate trade is awaiting with interest and, in some quarters, with considerable nervousness an official announcement from the managers of the American Tin Plate Company of their policy in regard to prices, selling arrangements, &c. Nothing definite is yet known in this neighborhood as to the views or intentions of the trust officials, which seem to have been very closely guarded. We learn, however, from our Chicago representative that a meeting was held in Chicago the latter part of this week of the officers and Executive Committee, at which, it is understood, final arrangements were to be made regarding the selling centers, prices and other matters which will need to be settled before the new company can get into regular working order. As a very large number of questions would come up for consideration and decision, it is not unlikely that the officers and committee may remain in session for several days. To the time of this writing nothing can be learned of their proceedings.

In regard to the matter of selling the product of the tin plate mills, it is authoritatively stated in the trade that the main offices of the company will be located at Chicago. We learn also that the new company have arranged with Phelps, Dodge & Co. for the rental of an entire floor in the new Phelps-Dodge Building, corner of Cliff and John streets, New York. It is also stated that William T. Graham will make his headquarters in Chicago and not in Pittsburgh, as was previously reported. This looks as though Mr. Graham would be in charge of the sales department. It is considered certain that an office will also be opened in Pittsburgh. The work of management, it is said, will be divided among a certain number of practical tin plate men, who will each have the superintendence of a group of mills.

No information has leaked out as yet as to the company's source of supply in the shape of steel bars. Heretofore, however, the main producers of tin plate bars have been the Ohio Steel Company of Youngstown, Ohio; the Bellaire Steel Company of Bellaire, W. Va.; the Shenango Valley Steel Company, New Castle, Pa., and the Aetna-Standard Iron & Steel Company of Bridgeport, Ohio. Supplementary to these bars have been sold in the market at different times by Carnegie Steel Company, Limited, Pittsburgh; Cambria Steel Company of Johnstown; King, Gilbert & Warner Company of Columbus; Buhl Steel Company of Sharon; Illinois Steel Company of Chicago, and the Apollo Iron & Steel Company of Vandergrift, Pa. Both the American and New Castle works include bar mills. In this connection it is interesting to note that William T. Graham, the second vice-president and director of the American Tin Plate Company, was president of the Aetna-Standard Iron & Steel Company; that William E. Reis is a member of the new board of directors and was also a stockholder and the treasurer of the Shenango Valley Steel Company, and that Warner Arms, the third vice-president and member of the Executive Committee of the American Tin Plate Company, was also connected with the Buhl Steel Company. It is also stated that the Illinois Steel Company are stockholders in the new company to the extent of upward of 5000 shares. Of the three tin plate manufacturing concerns not included in the consolidation—namely, the Canonsburg Iron & Steel Company, the Lalance & Grosjean Mfg. Company and the St. Louis Stamping Company—the last named are the possessors of a bar mill.

What the arrangements are between the makers of tin plate bars and the American Tin Plate Company is not known. That some form of control of the supply of the raw material must be a conspicuous feature of the organization of the consolidated concern is regarded in the trade as a certainty. If any group of men, with money enough to build a tin plate plant, could without difficulty obtain a supply of tin plate bars in the open market then competing mills would spring up.

As was intimated in our last week's report, the managers of the old American Tin Plate Company and the New Castle interests are more strongly represented in the new company than any others. The representatives of the Pittsburgh mills are noticeably in the minority. In this connection it is stated that the American interests hold \$4,000,000 of the preferred stock and the New Castle \$3,000,000. This gives the former the voting capacity of \$8,000,000 and the latter \$6,000,000. Together with Judge Moore's \$10,000,000 of common, the total of this stock is \$24,000,000, which is the controlling factor in the \$46,000,000 of stock which had been issued.

## SCRAP.

A Terre Haute, Ind., special reports that Crawford Fairbanks, a capitalist of that city, who has been largely interested in the straw board trust and other big industrial enterprises, is trying to organize a company with a capital of \$500,000 to establish a Tin Plate plant at Terre Haute.

A little pink pamphlet of neat get up sent out by W. F. Janeway, Columbus, Ohio, calls attention to his special brands of reliable Roofing Plates—namely, W. F. Janeway's Special Old Style, Franklin Re-dipped Old Style, Harold Old Style, Emory, Dennis and Lowery. These Plates are all guaranteed to be strictly pure palm oil coated. A detailed description of the process of coating adds interest to the circular. At the end is presented a view of the fine new gymnasium and drill hall of the Ohio State University, which is roofed with Franklin Old Style Tin.

The new addition to the works of the Morton Tin Plate Company, Cambridge, Ohio, has been completed and will be ready for operation by January 1. The plant now consists of six hot mills and six cold mills, with buildings 500 feet in length and 135 feet in width. A new 1025 horsepower engine and four new boilers, making nine in all, have been installed in the new part of the works. The Morton Company's plant has been run constantly during the past year, and they are specially proud of the fact that not a single roll has been broken in 17 months.

A press dispatch from Elwood, Ind., dated December 20, says: "Notice has been issued by the Tin Plate Trust that the big plant here would start in all departments Monday. The plants at Middletown, Montpelier and Atlanta will be moved to Elwood and consolidated with the factory here."

Some of the Tin Plate works included in the Trust resumed operations this week on the completion of stock-taking and inventories, and others will start up on Monday. These works will, it is understood, run exclusively on accumulated orders for early deliveries. New orders will not be entered until after January 1, by which time the final details of the new consolidated company will, it is expected, be completed.

E. Hanessen, a Steel manufacturer of Genoa, Italy, who has been visiting this country, was in Pittsburgh recently. He states that there are now three Tin Plate works in Italy, one of which roll Black Plates from imported Bars, while the two others are dipperies. A second Black Plate mill was built some time ago, but failed through mismanagement. The Italian dipperies buy their Black Plate from Wales, and find their business profitable, the duty on finished Tin Plates being \$36 a ton, while the duty on Black Plate is only \$24 a ton.

William H. Banfield, of Wallace, Banfield & Co., Limited, tin plate manufacturers, whose plant is located at Irondale, Ohio, and which has been absorbed by the American Tin Plate Company, has been appointed general manager of the works at Irondale, Lisbon, Ohio, and New Castle, Pa.

W. T. Graham has resigned his position as president of the Aetna-Standard Iron & Steel Company, Bridgeport, Ohio. Mr. Graham has been appointed first vice-president of the American Tin Plate Company and will make his headquarters in Chicago and not at Pittsburgh, as previously reported.



# SHEET METAL WORK.

## Roof Painting.

There is money to be made out of roof painting if it receives the attention which its importance entitles it to receive. Too often it is looked on as only a step higher than whitewashing, is done largely for appearance sake and is expected to last only a short time. If roof painting is to be made a branch of a business the same care should be taken to make it do its share in building up a reputation for good workmanship and serviceable materials as is given to the roof itself, or the heater work, plumbing or anything else that is done by the shop.

The men who do it should be encouraged to feel that their work is important, must be done well; they must not be allowed to think that it is cheap work and "any old way" will do providing they smear over enough surface in a day. They should be required to take care of the materials and tools just as carefully as the bright tin

The bottom can be double seamed on before the upper body is put on to the lower one. A flaring cover should be double seamed to the upper body and should have a round hole with cover about 8 inches in diameter in the center. Where the upper and lower body slip one over the other at the center a few rivets should be put in to hold them firmly together and then the joint should be heavily soldered inside and outside. A finish and strength is given by putting a swedged band at the top, bottom and between, also well soldered. A brass oil cock large enough to let oil be drawn quickly should be soldered into the body within  $\frac{1}{2}$  inch of the bottom and bosses should be soldered on each side to brace it.

The number of tanks required depends on the views held by the roof painter and three will be enough in any case, one for boiled linseed oil, one for raw linseed oil and a smaller tank for Japan drier. Some men mix the two kinds of oil or buy it mixed, and then two tanks are



*Roof Painting.*

plate is taken care of and the best tools of the other mechanics are cared for. A place and proper provision should be made for storing them so the oil will not waste, the paint cannot harden and the brushes become ruined by drying.

The provision made for this purpose by M. Abbott's Sons, 137 Eighth avenue, New York, has much to recommend it and a view in the part of their shop devoted to the roof painters, which is given herewith, will with the description be sufficient hint to those who make a specialty of roof painting to profit by their example. A strong platform is built about 14 inches high, carried by legs made of 3 x 4 inch timbers supporting a frame made of the same size of timber, on which the floor of the platform is laid. The legs should be placed so that there will be a space of about 3 feet between them. The platform should be about 30 inches wide and long enough for the oil barrels or tanks.

Tanks made of galvanized iron take up less room, as they can be made higher and of less diameter than barrels and can be kept cleaner. The iron should be of 24 gauge, and if 24 inch iron is used two widths will give ample height to hold a barrel when the diameter is 20 inches.

enough. On the floor in front of the oil tank platform a galvanized iron tray or pan should be placed to hold the measures and funnels and catch any dripping. The pan, heavily wired around the top, should be about 1 inch deep and about 14 inches wide and as long as the platform. This will allow the paint can to be placed in the pan while the mixing is done, and will afford a place where paint cans can be kept from marking the floor when in the shop.

A substantial wooden tub or half of a barrel should be kept full of water at one end of the platform, in which the paint brushes may be placed when not in use. They should be kept covered with water so that they cannot dry out and harden, for to do good work in painting the brush must be of good material and soft and pliable, so that the paint can be well rubbed in. A specially made brush on the pattern of the whitewash brush but of better material and thicker is best for the work.

In mixing the paint there is room for some judgment to be displayed, and the views of Philip Goodwine, who has been in the roofing business in the vicinity of his present shop at 58 Eighth avenue since 1858, on this subject should be of interest. For the body any of the good



paints sold by the roofing supply houses will give good service if ground fine. The mixing depends on the time of year. In the summer a drier is unnecessary if the weather is clear long enough for the paint to set well before a rain comes. Only good linseed oil should be used in summer and for painting it should be mixed in the proportion of 3 gallons of boiled oil to 2 gallons of raw oil, and if for the first coat on a new tin roof it should be mixed thin, so that this coat will dry out thin and hard after it has been well rubbed in. Every part of the roof should be thoroughly covered and care taken to leave no pools or thick coat at any place. If the work is done in cooler months or winter, when a skin will form before the paint can thoroughly dry out, a drier may be used in the proportion of 1 quart of the drier to 5 gallons of oil, more or less according to the weather; less oil when very cold.

A cheap and poor drier should never be used, but always a good drier; the cheapest in the end and the best is a drier that costs about \$1 per gallon. After a roof has had a first coat of this kind of paint it should stand six months and then be painted again. For the second coat the paint should have more body but should be rubbed in with the same care, using the drier only when the paint is put on in cold weather. The roof will now stand for three years, when it should receive another coat of paint applied in the same careful manner.

Another important point that must be considered is the condition of the roof at the time it is painted, particularly a new roof. If one of the cheaper, lighter coated tin plates is used it must stand a few days, so that the grease and rosin will come off, and then it must be swept with a stiff broom to get off all the grease, rosin, dust, and particularly rust. If there are any rust spots they should be swept till all rust has disappeared and a clean surface is presented; then the roof is ready for painting. If one of the better old style heavy coated oil flux plates is used the roof may stand a shower or two before the metal is exposed, so as to take the paint properly.

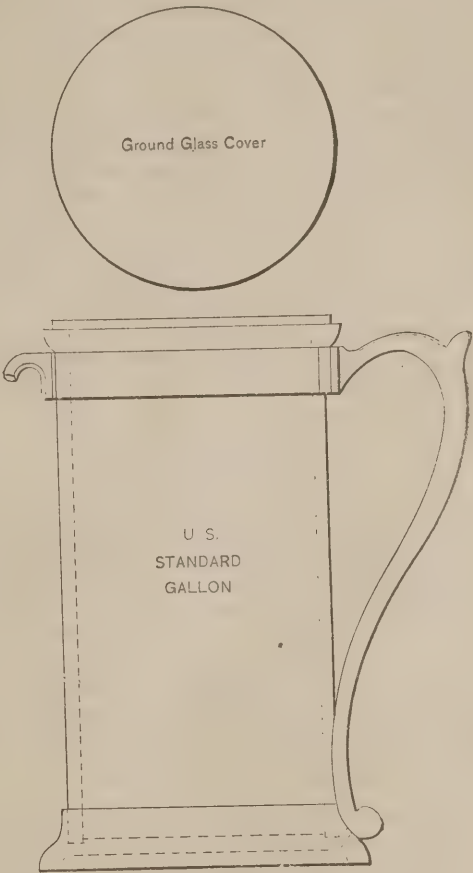
If roofs are treated in this way a guarantee against leaks for a period of time may be given if the roofer has put on the tin with the same care. This guarantee carries a great deal of weight with those who look after the properties of estates and costs nothing if good materials are used throughout with good workmanship and under intelligent supervision. This branch of business can be built up by keeping before those who own roofs the fact that leaky roofs destroy plaster, spoil paint and ruin furniture, besides making the house damp and unhealthy. Leaky roofs destroy themselves, but roofs kept in repair and painted honestly with honest materials will last indefinitely, as demonstrated by the fine condition of a piece of bright tin plate taken from an old roof this year by Mr. Goodwine that was put on in 1848. This tin is still bright on both sides and could be readily soldered. The sheets were 10 x 14 in size and five nails were used in each sheet.

The U. S. Standard Gallon.

We received an inquiry recently for a rule for testing gallon and half gallon measures or for information as to where a set of patterns could be obtained with the government seal upon them. So far as we know the central government at Washington does not publish any standard patterns, but it does issue to the state governments from the Department of Weights and Measures of the Coast and Geodetic Survey standard measures by which the commercial measures can be tested. The standard U. S. gallon contains 231 cubic inches, from which the capacity of the smaller measures can be readily figured, giving for the half gallon 115.5 cubic inches; quart, 57.75 cubic inches; pint, 28.875 cubic inches and half pint, 14.4375 cubic inches.

We have received from the Department of Weights and Measures at Washington a scale drawing of the standard U. S. gallon together with a table of dimensions of the gallon and smaller measures. In the accompanying

engraving we have reproduced the drawing which is made on a scale of 1/4 inch to the inch. We also reprint the table giving the dimensions of the measures, as well as the size of all its parts down to the smallest detail. The standards, it will be seen, are all in the form of cylinders, while commercial measures are usually flaring vessels like the frustum of a cone or an inverted frustum. It will be noticed that the standard gallon is proportioned with its altitude exactly double the diameter, and if any reader is curious to test the dimensions, he will discover



(One-Quarter Scale.)

The U. S. Standard Gallon.

that this measure contains 231.2 cubic inches or one-fifth of a cubic inch more than the theoretical standard.

Table of Dimensions of Standard Measures.

|  | Gallon.<br>Inches. | Half<br>gallon.<br>Inches. | Quart.<br>Inches. | Pint.<br>Inches. | Half<br>pint.<br>Inches. |
|--|--------------------|----------------------------|-------------------|------------------|--------------------------|
| Internal attitude of cylinder.                         | 10.560             | 8.382                      | 6.652             | 5.280            | 4.191                    |
| Internal diameter of cylinder                          | 5.280              | 4.191                      | 3.326             | 2.640            | 2.095                    |
| Total height of vessel.....                            | 11.28              | 9.11                       | 7.1               | 5.860            | 4.65                     |
| Thickness of flange on which<br>glass cover rests..... | 0.42               | 0.38                       | 0.29              | 0.27             | 0.24                     |
| Height of flange on which<br>glass cover rests.....    | 0.49               | 0.49                       | 0.48              | 0.40             | 0.30                     |
| Width of ring .....                                    | 1.00               | 0.82                       | 0.71              | 0.61             | 0.53                     |
| Thickness of ring.....                                 | 0.16               | 0.13                       | 0.10              | 0.10             | 0.10                     |
| Diameter of base.....                                  | 6.77               | 5.25                       | 4.45              | 3.68             | 3.05                     |
| Thickness of flange of base...                         | 0.47               | 0.37                       | 0.36              | 0.21             | 0.18                     |
| Thickness of walls of cylinder                         | 0.20               | 0.15                       | 0.14              | 0.13             | 0.12                     |
| Height of top of base casting,<br>above base .....     | 1.13               | 1.01                       | 0.95              | 0.83             | 0.77                     |
| Diameter of glass cover.....                           | 5.7                | 4.50                       | 3.60              | 2.90             | 2.43                     |
| Thickness of glass cover.....                          | 0.25               | 0.25                       | 0.25              | 0.25             | 0.25                     |

CHICAGO SHEET METAL WORKERS' WAGES.

The Amalgamated Sheet Metal Workers' Union of Chicago have adopted a scale of wages for next year which provides for an increase in wages of 10 cents an hour. The present scale calls for 35 cents an hour.

Several other radical changes have been made. Some time ago the Employers' Association refused to pay helpers time and a half for all over eight hours in any one day. This has been provided for in the new agreement.

Here are the new and amended clauses in the agreement:

"The minimum rate of wages shall be 45 cents per hour for journeymen sheet metal workers.



"All overtime for journeymen, helpers or apprentices shall be paid for at the rate of time and one-half up to 10 o'clock at night, after which all overtime between the hours of 10 p.m. and 8 a.m. shall be paid for at the rate of double time. All Sunday work and legal holidays—viz.: New Year's, Fourth of July, Thanksgiving and Christmas, or days celebrated as such, shall be paid for at the rate of double time. No work shall be permitted on Labor Day.

"It is further agreed that regular pay days shall be not more than one week apart, and in case of a lay off the men shall be paid within 24 hours. If not, then they shall receive waiting time at the minimum rate per hour.

"No firm, or any member thereof shall be allowed to handle tools on outside work.

"All disputes arising under this agreement shall be submitted to a Board of Arbitration, composed of seven members, three to be selected by each party, and the seventh to be chosen by those so selected; provided, that no definite part of this agreement shall be subject to arbitration."

The increase of 10 cents an hour is made, it is said, because the employment of a sheet metal worker is becoming more uncertain every day.

The union has about 2000 members, who have voted unanimously for the new scale, which will go into effect April 1.

## FLASHINGS.

The G. Drouve Company of Bridgeport, Conn., manufacturers of Cornices and Skylights, are now putting on the market both Galvanized Iron and Roofing Tin in rolls, for valleys and gutters. The Tin is put out in 14, 20 and 28 inch widths, with 100 square feet in each roll, and the rolls of Galvanized Sheets are 28 inches wide and 43 feet long.

The firm of Looney & Berghauser, Nevada, Mo., have been succeeded by Bruce Looney, manufacturer of Iron Cornices, Skylights, Window Caps, &c. The catalogue issued by Mr. Looney shows a varied line of goods of interest to the Roofing and Sheet Metal trade.

A pretty pamphlet is issued by Gara, McGinley & Co., Philadelphia, Pa., giving some facts about plaster corners, with special reference to Wood's Steel Corner for plastered walls, of which they are the sole manufacturers. The illustrations and description in the little pamphlet are set forth in a very attractive way and will interest the trade, who can get a copy on application.

The Hampden Cornice Works have lately moved across the way to 26 Taylor street, Springfield, Mass., where they have increased facilities for carrying on their business. They have lately taken some large contracts and are now very busy. They are now doing the Cornice and Sheet Metal work on the new Morgan factory, also the Sheet Metal work for the new two story and basement building of Armour & Co. at Portland, Maine, and are furnishing the Cornice work for the new block at Northampton, Mass., which is being put up by F. P. Newkirk.

In the article from *The Iron Age* reprinted in *The Metal Worker* of December 10, on Galvanized Sheets in Chili, an error was made in stating that the 24 foot 10 inch lengths of 22 or 24 gauge retailed in stores for about \$1, gold, per sheet or \$7.20 per square. The dimensions should have been 24 inch 10-foot lengths.

Galvanized Iron Skylights, Water Tanks, Ventilators and Finials are the subjects treated in an illustrated circular and price-list issued by the National Sheet Metal Roofing Company, Jersey City, N. J. Half-tone and line illustrations show the goods in general and sectional view, while tables of prices and sizes are presented.

Montross Metal Shingle Company, Camden, N. J., manufacturers of Metal Shingles and Tiles, call attention to their goods in a novel circular got up in the form of an old oak door, which opening displays within illustrations of portions of roofs covered with Octagon Shingles, Eastlake Shingles, Diamond Tiles, Victor Shingles and Gothic Tiles.

Hubbert & Hubbert, manufacturers' agents, have removed from Room 1435 to Room 938, Monadnock Building, Chicago. They are now selling the product of the Corning Steel Company of Hammond, Ind., who have just put in a large galvanizing plant for galvanizing Steel Sheets.

## Some Facts About Calcium.

Sir Robert Ball, an eminent English scientific authority, has an interesting article in the *Humanitarian* on the subject of calcium. Though lime, in its many forms, is one of the most ordinary substances met with on this earth, says Sir Robert, yet the essential element which goes to the composition of lime is not by any means a familiar body. As is well known to every one who has learned any chemistry, lime is the result of the union between oxygen gas and the metal calcium. This very remarkable element, calcium, is, however, never found in nature unless in such intimate chemical union with some other element, like oxygen or chlorine, that the characteristic properties of the metal are disguised. To see calcium itself, you must go to the chemical laboratory, where by ingenious processes the shy element is temporarily divorced from its union with the oxygen or other body for which it has so eager an affinity.

Though most of us have never even seen a particle of calcium, it may well be doubted whether there is any element more important to the economy of this earth or more widely distributed over it. Calcium abounds in every soil. Calcium is in the waters of the sea. The cup of spring water owes much of its invigorating freshness to the calcium which it holds in solution. The white cliffs which have given the name of Albion are but one of the many forms of calcium.

Try to imagine what this earth would be like if calcium were withdrawn. The birds could not lay eggs. The sea could produce no shells. Man and other animals would need to have bones very different from those which they at present possess. Buildings would in great part vanish. Even the hills and mountains would, to a considerable extent, disappear. Probably a very large part of the total mass of this earth would be taken away if all the calcium were to be removed.

Without calcium a world inhabited in the same manner as our present abode would be clearly impossible. There are, it may be, lowly organisms on this earth to which calcium is apparently of no appreciable consequence, and it is conceivable that a world of living types of some kind could be constructed without the aid of that particular element which is generally so indispensable on our globe. But such a world would be totally different from that world which we know. Under present conditions the significance and importance of calcium in our economy can hardly be overestimated.

Attention has been drawn to the importance of calcium on the earth; we have now to add that this same element appears to be most widely distributed among the various bodies in the universe. Among the most remarkable features in the photographic spectrum of the sun are two very broad and dark and very conspicuous lines. In every photograph of the ultra violet light of the sun these lines stand forth so boldly as to arrest attention more than any other feature of the spectrum. It had been known that these lines were due to calcium, but there were certain difficulties connected with their interpretation. Some recent researches by Sir William and Lady Huggins have cleared away all doubts. It is now certain that the presence of these lines in a spectrum demonstrates that the remarkable element which enters into the composition of lime on this earth is also in the sun. These same lines have, indeed, been detected in the photographic spectrum of many other bodies. Thus the interesting fact is established that this particular element, which plays a part so remarkable on our earth, is not peculiar to our globe, but that it is diffused far and wide throughout the universe.

Announcement has been made of the consummation of a plan for the consolidation of all the street railways in and around the city of Baltimore, Md. The sum involved is said to be about \$28,000,000.

Congress has passed a bill appropriating \$350,000 in aid of the exposition to be held next year in Philadelphia under the auspices of the Philadelphia Commercial Museums.



# STOVE TRADE NOTES.

## MEETING OF THE NEW YORK STOVE MEN.

Another well attended meeting of the New York City Stove, Range and Furnace Manufacturers' Association was held at the Astor House, Tuesday of this week, with President P. B. Acker in the chair. There were a number of minor matters taken up and profitably discussed and acted upon. A principal feature of the session's work was the consideration of heating goods, on which a new schedule of prices will, it is believed, go into effect on or about January 1. The next meeting of the association will be held at the call of the chair and will probably be fixed for some date early in February.

## Traveling Salesmen for 1899.

Supplementing the list of traveling stove salesmen for 1899 given in our last issue we present the following:

**Rock Island Stove Company**, Rock Island, Ill., will be represented by M. S. Morehouse, who will visit the trade in Kansas; H. M. Conklin in Kansas and Oklahoma, A. C. Colton in Nebraska, E. B. Waterman in Northwestern Iowa, Northeastern Nebraska and South Dakota; A. Leonard in Central Iowa, A. B. T. Moore in Eastern Iowa and Northern Illinois, S. D. Cleland in Southern Iowa and Northern Missouri and A. D. Sperry in Central Illinois.

**Bergstrom Brothers & Co.**, Neenah, Wis., will have their interests looked after by Fred. W. Lucas, who will travel in Minnesota and North Dakota; R. J. Bird, who will cover Minnesota, Iowa and South Dakota; C. S. Youngs, who will look after the trade in Wisconsin and Michigan, and W. A. Wilson in Iowa and Nebraska.

**Thomas White Stove Company** of Quincy, Ill., have arranged with Henry Wilson, M. Kirtley, J. H. McAfee, C. W. Shinn and W. H. Wood to visit the trade in their interests in Missouri, Kansas, Oklahoma and Indian Territories, Colorado, Nebraska, South Dakota, Minnesota, Iowa, Wisconsin and Illinois.

**Bloomington Stove Company**, Bloomington, Ill., will be represented by M. N. Hagoman, who will cover the trade in Indiana; B. F. Wilson in Illinois and William Henderson in Iowa.

**H. Wetter Mfg. Company** of Memphis, Tenn., will be represented by A. H. Snead, who will look after their trade in Texas; William B. Hamilton in Alabama and Mississippi, O. L. Dillon in Mississippi, Louisiana and Arkansas; F. T. Graham in Arkansas and Missouri, W. C. Bryan in Tennessee, Missouri, Arkansas and Kentucky; W. H. Wooldridge in Georgia and South Carolina and H. R. Wynne in Kansas and Nebraska. The company inform us that there are three appointments yet to be made.

**Richmond Stove Company**, Richmond, Va., will be represented by J. R. Livesay, who will visit the trade through the Southern States; H. G. Hopkins, who will cover Delaware, Maryland, West Virginia and Kentucky; Lee G. Crutchfield, who will look after the company's interests in the State of Virginia, and W. J. Anderson, who is designated as a special salesman.

**Co-operative Stove Company**, Bloomington, Ill., will have their interests looked after this year by John W. Hayes, who will travel in Indiana and Illinois; C. A. Hamilton in Illinois and A. C. Hamilton in Iowa and Illinois.

**Giblin & Co.** of Utica, N. Y., will be represented by Henry Cowles, who will cover the New England States, New York, Pennsylvania, New Jersey, Maryland and Delaware; Frank R. Peckham, whose territory will be

confined to New York State; George J. Giblin, who will travel in Michigan, Ohio, Indiana, Illinois and Wisconsin, and Frank L. Nesbit, who will cover Minnesota, Ohio, Missouri, Kansas, Nebraska, Colorado, Montana and North and South Dakota.

**A. T. Nye & Son**, Marietta, Ohio, will have their interests looked after by A. T. Nye, Jr., who will cover Ohio, Indiana and Illinois, and Ed. Highland, who will travel in Southern Ohio, West Virginia, Virginia, Kentucky and Maryland. We understand that there is one salesman yet to be appointed.

**Townley Stove Company** of Terre Haute, Ind., have arranged with John J. Shuttleworth to look after their interests in the State of Illinois; D. E. Oakes, who will cover Indiana, and J. L. Catlett, who will visit the trade in Illinois.

**The Favorite Stove & Range Company**, Piqua, Ohio, will have their interests this year looked after by the following salesmen, who will cover the territory indicated: W. H. Pier will travel in Wisconsin, W. L. Miller in Iowa, James W. Buffington in Missouri, Kansas and Nebraska; J. S. Cadot in Michigan, J. E. Schroyer in Southern Indiana and J. C. Frame in Northern Indiana, Thomas B. Clemons in Northern Ohio, Pennsylvania and Northern New York; Cloyd Smith in Central and Southern Ohio, Joseph C. Taylor south of the Ohio River. Representatives from the St. Paul branch will travel in Minnesota, Montana, the Dakotas and Oregon. B. F. Blymyer, 67-69 Lake street, Chicago, will look after the trade in that city, while the Kansas branch will care for the trade in Kansas City, Mo. Arrangements for covering Illinois have not yet been made.

**Eugene Munsell & Co.** of New York and Chicago will be represented during the coming year by the following staff: C. William Dottermusch will look after the trade in New York State and Western Massachusetts, Rufus Van Valkenburgh in New Jersey and Connecticut, C. W. Yasinski in Greater New York and George W. Elliott in the city of Boston and vicinity. Augustus Krieg will look after the building trade in New York City and vicinity, E. C. Wood will attend to the mica business among the stove manufacturers and hardware jobbers and Charles E. Coleman will represent the interests of the company among the Western trade.

**Black & Germer** of Erie, Pa., will be represented by the following salesmen: H. H. Tighe, with headquarters in Chicago, will look after the trade in Nebraska, Central Iowa, Colorado and Utah; R. A. Wheeler in Northern Iowa, Minnesota, North and South Dakota; Arthur Corson in the State of Illinois, O. J. Allison in Southern Iowa and Kansas, W. S. Jackson in Wisconsin and Northern Michigan, H. H. Sanford in Ohio, Southern New York and Western Pennsylvania, and W. C. Ebisch in Indiana and Eastern Pennsylvania.

**The B. C. Bibb Stove Company** of Baltimore, Md., have appointed the following traveling salesmen for 1899: Howard Woolford will visit the trade in the city of Baltimore, Washington and a part of Maryland; W. B. Hargrave will cover Virginia, West Virginia, Delaware, North Carolina and a part of Maryland. The salesman who has heretofore covered South Carolina, Georgia and Florida is dead and a new appointment has not yet been made.

**The Phillips & Buttorff Mfg. Company** of Nashville Tenn., will be represented by the same staff of traveling salesmen as looked after their interests the past year. The staff will be augmented, however, by five or six new men, who will go on the road soon after January 1, but the names of these are not available at this writing.



The Marion Stove Company, Marion, Ind., have arranged to have their interests looked after by the following salesmen, who will cover the territory indicated: H. E. Rechner will travel in Ohio, Thomas Fruchey in Indiana and Illinois, W. F. Paine in Michigan, E. A. Ridgeway in Nebraska, Missouri and Kansas, and H. J. Cooke in South Dakota.

### A CHICAGO BRANCH.

We made brief mention in *The Metal Worker* December 17 that Black & Germer, Erie, Pa., would open a Chicago branch, which they will occupy on January 1, to be located at 235-247 Newberry street, the premises formerly occupied by Charles E. Clark. The location of this building is in every way admirable for the purpose, it affording exceptional railway facilities for shipments to all parts of the continent. The building is between two main lines of railway, giving shipment over the Chicago, Burlington & Quincy, Chicago & Northwestern (Southern branch), Chicago, St. Paul & Kansas City, Baltimore & Ohio, Northern Pacific and Wisconsin Central railways. The Chicago house will be in charge of E. G. Germer, son of Otto Germer of the firm, while N. H. Tighe, formerly with Charles E. Clark and thoroughly familiar with the trade in that locality, will attend to the local trade and also travel West. The Chicago warehouse will be stocked with a full line of base burners, cooks, ranges, air blast furnaces and gas heating stoves, all of which are sold under the well known name of the "Radiant Home." The Ringen Stove Company, St. Louis, Mo., will be the Southwestern agents for Black & Germer, and the O. K. Stove & Range Company of Louisville will act as Southern agents.

### FIFTIETH ANNIVERSARY OF THE DERR STOVE WORKS.

On the evening of December 12 Charles F. Derr, proprietor of the Derr Stove Works, Pottsville, Pa., entertained the employees of his establishment at Riland's, the occasion being the fiftieth anniversary of the founding of the works. The business was started in the latter part of 1848 at the corner of East Norwegian and George streets, the property then being owned by Elias Derr, deceased. His brothers, Joseph and Simon Derr, started the stove works in the year named, since which time the property has remained in the family. In 1851 the business was operated under the name of J. & S. Derr, but in 1865 Joseph Derr retired and the business was carried on under the sole proprietorship of Simon Derr, until his death in September, 1891, when his son Charles F., the present proprietor, succeeded to the business. As time went on, additions were made to the original plant in order to keep up with the growing demands of the trade. In the early days of the industry tin and sheet iron works were added to the stove department, John Derr, a brother of the owners, being foreman until his death. In 1853 Simon Derr invented a portable double heater which became famous, the device being also manufactured subsequently by a Philadelphia concern. The works have given employment to something over 30 hands, and a happy feature in connection with the industry is that there has never been a disagreement between employer and workmen. Some of the men have been with the concern for a long period, Hugh Stevenson, for example, having been employed 38 years, Barney Keenan 35 years and William Stevenson 33 years.

The Phillips & Buttorff Mfg. Company, Nashville, Tenn., favor us with a four-page folder illustrating and describing their new Superb Hot Blast, intended for burning hard coal, soft coal and slack. The object in view in the construction of this Stove was to obtain the highest degree of radiation and economy, and the manufacturers claim that it will save 50 per cent in fuel over the old style heating Stove. "The patent double flue draft takes the cold air from the floor, superheating it before it reaches the fire pot, and the gases which would otherwise escape are instantly consumed, thereby giving it a uniform, steady heat equal to the best hard coal base burner."

### THE HOME STOVE WORKS

of Chicago, Ill., favor us with a copy of a very attractive catalogue which they have issued calling attention to some of their leading ranges, cook stoves and heaters. There are 48 pages, each of which has an ornamental head piece printed in a color different from the body of the work, and the binding is in heavy paper covers somewhat larger than the pages, so as to protect the edges. The side title consists simply of the name and address of the company in heavy black script letters on a light terra cotta ground. The leading place is given to the Columbia Home range for hard or soft coal, coke or wood. It is attractive exteriorly and embodies among its features of construction patent oven door opener, oval fire box, iron stone or cast sectional linings, double acting draw center grate or duplex grate according to preferences, large sheet flue and top damper connected directly with the pipe. Following this is the Park Home range, which is the latest addition to the company's line of Home ranges. In bringing it out the aim has been to give the largest amount of oven and top room possible and to place the weight of iron where it would add to the durability of the range in use. The Modern Home is another attractive specialty which has been brought out to meet the requirements of a large class who demand a range with all the modern features of utility, convenience and durability at a price to sell. The Perfect Home and the Prize Home are also illustrated and described. Among the cook stoves we find the Magic Home, the Standard Home and the Peerless Home, the latter being a four-hole construction intended for burning wood only. Among the heaters the Columbia Home square base burner, offered in three sizes, occupies the place of honor. One of the features to which special attention is directed is the ventiduct circulation, the construction being such that the air in the ventiduct is heated from the instant it enters the flue on the bottom until it is discharged in the hot air chamber in the dome. This hot air chamber occupies the entire space of the dome between the feeder and the outside of the stove and extends down at the back to a level with the pipe collar. The Modern Home heater is another member of this general class, being of attractive exterior and offered in four sizes. This is followed by the Perfect Home heater for hard coal and the Cottage Home heater for wood only. Several pages are devoted to illustrations of crestings and finials in iron, and there are also shown illustrations of several discontinued patterns for which the company can furnish repairs.

### THE FOSTER STOVE COMPANY.

We are indebted to the Foster Stove Company of Ironton, Ohio, and Louisville, Ky., for a copy of an 86-page catalogue which they have just issued from the press, illustrating and describing some of their leading specialties in the way of cook stoves, ranges and heaters. The leading place in the catalogue is given to Foster's range, an exceedingly handsome construction, the decoration consisting largely of cast ornamentation in conjunction with nicked parts. The range has a removable top and front oven plate, and by the company's patented method it is said that in 15 minutes one can replace either oven plate by simply taking off the covers of the range. It is made in two sizes and the usual modifications. Following this construction is the Lexington Belle, a six-hole construction for coal or wood; Foster's Jewel, a four-hole cook stove of rich design; the Banner, another four-hole cook for coal or wood; the Sun Shine, Pine Grove, Kenova, Foster's Pride, Ivanhoe, Ivy and Foster's Merit, the last mentioned being wood cooks offered in a variety of sizes.

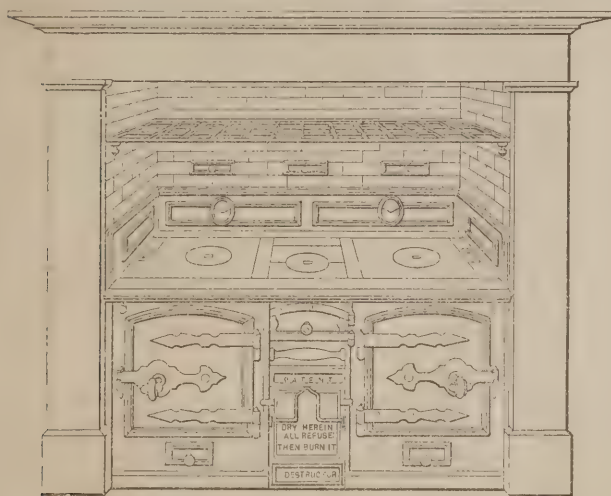
The first place among the heaters is given to Foster's Slack Burner, which, as its name indicates, is intended for burning slack or the screenings of coal, which is among the cheapest fuels known. It is constructed on the base burner or reservoir principle, having a magazine that will hold sufficient fuel to last from 6 to 24 hours, according to the amount of heat required. In operation the draft is admitted at the base of the fuel contained in the



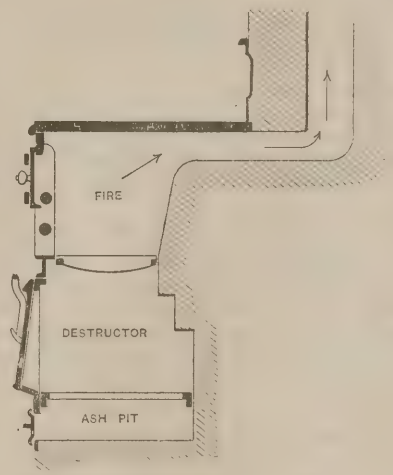
magazine. The lower section of the magazine is made of heavy cast iron sections, which are perforated with two rows of small holes. These fire linings are incased within an iron cylinder into which the draft is admitted through an opening that can be partly or entirely closed by a slide. In its passage around this casing and through the small openings in the fire linings the air is heated to a high temperature before it comes in contact with the fuel. Foster's Air Tight, made in three sizes; the Birdie, a Franklin heater for hard or soft coal and natural gas; the New Legacy, which has been improved since last year; the Foster Oak, the Iron Age Oak and the Vernon, a fancy box for wood, are some of the other constructions to which attention is given.

### A DOMESTIC GARBAGE BURNER.

In the accompanying illustrations we present front and sectional views of a stove so constructed that it may be employed for burning the combustible refuse of the house. This "destructor," as it is called, is so arranged as to provide a receptacle in which the refuse is placed, this constituting, in effect, an efficient drying chamber,



Front Elevation.



Sectional View.

### A DOMESTIC GARBAGE BURNER

where the water laden materials are converted into good combustible matter. The adaptation of this contrivance to a close fire range tends to make a slow combustion chamber of it, and the ashes and *débris* from the coal fall through into the "destructor," and assist in drying the refuse there located. The destructor is not perfectly air tight, as a few small holes at the bottom allow sufficient air to pass in to carry the vapors of volatilized fatty substances up through the fire. It is claimed that by this arrangement there can be no risk of odors escaping, as nothing has a greater purifying effect than fire heat. Any odors which might be given off as the refuse is drying must pass upward through the fire and thence to the chimney. The device is of English manufacture, being turned out by James B. Petter & Sons, 73 Queen Victoria street, E. C., London, England.

### THE JOLIET STOVE WORKS,

Joliet, Ill., will bring out two new steel ranges about January 1. Their experience in the manufacture of steel cooking stoves and ranges has been quite satisfactory, and they believe that the new styles alluded to will be found well adapted to the requirements of the trade. The company's business has shown a handsome increase during the year, and they look forward with confidence to the coming 12 months. Their facilities have been improved steadily even during the depression, and their plant shows convincing evidences of thrift. Few works are located so advantageously for receiving materials and shipping goods. The warehouse and shipping department are

along the track of the Elgin, Joliet & Eastern Railroad, known as the Chicago outer belt line, which intersects all the railroads running out of Chicago, and being exclusively a freight road pays special attention to the interests of its patrons.

### The Sale of Gas Stoves.

BY OVERHEARD.

*Salesman*: "Now, Mr. Trade, as you have bought a sample of the finest steel range made, let me show you the finest line of gas ranges in the market."

*Mr. Trade*: "Not any for me, thank you. I can't sell them."

*Salesman*: "But you took the range because we would protect you and you could make a specialty of it, and the gas are just as fetching and we will protect you."

*Mr. Trade*: "No; the gas companies knocked the life out of the gas stove trade for me. I have sold them and formerly displayed them in my store. Let me relate what happened in my store one morning when the wife of one of my best customers came in.

*Mrs. Sterling*: "Good morning, Mr. Trade. I want to look at gas stoves, as I am thinking about buying one to cook with."

*Mr. Trade*: "I would be glad to show you gas stoves, but since the gas company have been selling them at the prices they cost me simply to get a chance to sell more gas I haven't kept them. I will tell you what I know about them so that you can select a good one, but there must have been improvements since I was well informed on the best construction."

*Mrs. Sterling*: "So you don't sell them?"

*Mr. Trade*: "I cannot afford to. There is no profit for anybody but the gas company, who get their profit from selling the gas and from selling the stove; in fact, there must be a loss when they deliver them to the customer and sometimes connect them free."

*Mrs. Sterling*: "Well, I'll think it over. If I bought from you I would see that you made it all right, but with my experience with gas meters and bills I'll wait a while before I hunt more trouble by dealing with a gas company."

*Mr. Trade*: "I can look the matter up for you and get you a good stove."

*Mrs. Sterling*: "Well, I'll think about it. I thought you had them and I would have no bother. Good morning."

*Mr. Trade*: "I answered, 'good-morning,' and, Mr. Salesman, between the gas companies, the department stores and the wholesalers who retail, if a man does not run specialties and receive protection he will find a profitable business just beyond his reach."



## ODD PLATES.

E. G. Germer, son of Otto Germer of Black & Germer, Erie, Pa., with N. H. Tighe of Chicago have been in New York the past week, after visiting the trade in the East and studying the conditions. They report a growing popularity for the Radiant Home goods in all parts of the country, and feel certain that with the opening of the new Chicago branch of Black & Germer the Western trade will become even better acquainted than they are at present with the extensive line of this house.

W. H. Switzer, president of the Superior Foundry Company, Little Falls, N. Y., has been making an extended tour among the heating trade in the South, where the Superior Furnaces are becoming popular and in demand. In passing through New York Mr. Switzer was a visitor at *The Metal Worker* office.

W. J. Myers of the Union Stove Works, 70 Beekman street, New York, and secretary of the New York City Stove, Range and Furnace Manufacturers' Association, is one of the 100,000 more or less victims of the gripe in this town. In the middle of the week he was at his home with this malady, but it is hoped that it will not keep him away from business very long.

Harry King has resigned his position with Janes & Kirtland and on January 1 will visit his friends in the trade in New York, Philadelphia, Baltimore, Washington and Richmond as a representative of the International Heater Company, 287 Water street, New York. With the varied line of heating apparatus which his new connection affords him a substantial welcome will doubtless be accorded him by the trade.

"Bakers That Bake" is the title of an 18-page pamphlet of pocket size which is being distributed by the Novelty Mfg. Company of Jackson, Mich. The text relates to the company's new Novelty Knocked Down Ovens, and several reasons are given why these Ovens are preferable to others now on the market. Among these reasons may be mentioned that they can be mounted in the store at an exceedingly small cost, or as the company put it "an inexperienced boy can mount one in five minutes." The Ovens stand perfectly plumb and square and make an attractive article when ready for use. They are packed for shipment in wooden cases only 4 inches deep, and will stack up in the store, it is said, as nicely as sardine boxes. If carried over from one season to another they are as nice and fresh as new goods when the dealer is ready to open them up. They do not get dented or bruised out of shape while in transit or in stock, and most important of all, the company state, the freight rate is very much less than on mounted Ovens. Illustrations are given showing how to mount the Ovens as well as showing the appearance of the Oven when "knocked down." The pamphlet is very neat in its make up and will doubtless prove interesting to dealers handling portable Ovens.

The Lennox Mfg. Company, Marshalltown, Ind., report an exceedingly satisfactory business during the past year in their Torrid Zone Hot Blast Steel Furnace, which they expect to manufacture next year, and will erect new buildings and install new machinery for this purpose, which will enable them, they advise us, to put out in the neighborhood of 2000 Furnaces.

E. H. Taylor, Jr., of the New York office of Isaac A. Sheppard & Co., will spend the Christmas holidays at his old home in Philadelphia.

We referred last week to the illness of William D. Southard, senior member of the firm of Southard, Robertson & Co., 287 Water street, New York. Mr. Southard, who is suffering from a stroke of paralysis that has affected the right side of his body, is at his home in Peekskill, and is getting along as well as could be expected under the circumstances. The change that has taken place in the past week is in the direction of improvement, and the hope is entertained that he will recover his health in time.

Tarrant & Co., Saratoga Springs, N. Y., are placing in Union School No. 3 two No. 65 Utica Standard Furnaces and one No. 24 Rival Furnace, manufactured by Giblin & Co., Utica, N. Y., to improve the heating system of the school, which has heretofore been found deficient.

The Bussey & McLeod Stove Company of Troy, N. Y., closed their foundry on the night of December 15.

In a recent issue of the *Detroit Journal* appears an interview with George H. Barbour, who thinks that the Common Council of Detroit should take up the question of street railway settlement again, and consider certain propositions in a business-like way. He feels that Detroit is losing, through a lack of proper enterprise, a great deal of business which might otherwise come to it.

A press dispatch from New Albany, Ind., December 16, states that Tomanus H. Gohman, a member of the firm of Terstegge, Gohman & Co., Stove manufacturers, died there, aged 63 years.

## Electric Power and Light in New York.

A company have been organized, whose interests are identical with the Metropolitan Street Railroad Company, to furnish electric light and power in New York City. The members of the new company, the New York Gas & Electric Light, Heat & Power Company, are William C. Whitney, W. L. Elkins, P. A. B. Widener, P. H. Flynn, Thomas H. Ryan, Thomas Dolan, Anthony N. Brady and Roswell P. Flower. The scope of the new company is explained as follows: We will presuppose that the electric system in Broadway is in operation. It has been demonstrated that the maximum demand for electricity for traction purposes extends over the hour and one-half between 6.30 and 8 o'clock in the evening. In this short space of time an almost incredibly large number of persons, returning from their work downtown, take the various transportation lines to the northern part of the city. During the hour and one-half the plant of the company, which has a horse-power of 70,000, and representing an investment of \$10,000,000, is taxed to its utmost. At other times it requires a much smaller expenditure of energy; so, in order to equalize matters and obviate the wear and tear incident to the slowing down or stoppage of the machinery, the company have determined that they will enter another field—that of supplying light, heat and power. Of these new elements, light is by far the most important, owing to its general use.

Observation has shown that the demand for electric light begins in winter, for instance, about 4 o'clock in the afternoon and increases rapidly until 10, when the maximum is reached. This maximum demand remains stationary until 1 a.m., when it begins to decline. Thus it will be seen that the demand for electricity for light and for traction dovetail. It is a reasonable supposition that the company who take advantage of the variance in these demands should profit by running the plant at its highest efficient capacity and conserve the surplus power by storage batteries or other means. In fact, with the demand for rapid transportation from one end of the city to the other, and with crowds at one time of the day and none at the rest, it would not pay a company to attempt to fill all requirements unless the surplus power could be disposed of. This the new company have decided to do.

The surplus power created in the plant at East River and Ninety-sixth street will be conserved in storage batteries and thence distributed to 21 subsidiary stations in various parts of the city. From these stations light, heat and power will be supplied for commercial purposes. The conduits which are being laid in Broadway and other thoroughfares will be utilized not only for the great feeder lines which will supply the subsidiary stations, but also for the distribution to consumers. At the power house this current has a voltage of 6000 and at the stations this will be reduced to 550 volts.

This sale of light, heat and power—by-products of electric traction, as we may call them—will result in great benefit to the people of the city. Within 18 months after the plant is in operation—which will be about January 1, 1900—the company figure that the price of electric lighting will decrease at least 30 per cent. to the consumers. It also makes possible further extensions of the electric railway lines—something which would not be possible unless the surplus product created by the plant and evidenced by light, heat and power could be sold.

Superintendent J. Ernest G. Yalden of the Baron de Hirsch Trade School announces that the school has been removed to its new building at 222 East Sixty-fourth street, New York.

A second order for locomotives for the Imperial Railway of China has just been booked by the Baldwin Locomotive Works, Philadelphia. It calls for 16 engines, of an aggregate value of \$130,000.

A dispatch from Odessa to the *London Daily Mail* says that the Russian Government has ordered that ten torpedo boat destroyers be built at that port, to be completed in two years. The vessels are designed to augment the Russian naval force in the Pacific.

Reports from all parts of California indicate the breaking up of the protracted drought in that State. Rain began falling last week, and has continued since, bringing satisfaction to the farmers as well as to the mining interests.

No branch of trade or industry seems to be outside the scope of the trust promoter these days. It is now reported that a syndicate is being formed in New Haven, Conn., with a capital of \$500,000, to monopolize the rag business.



# TRADE REPORT.

## METAL MARKET.

**Pig Tin.**—The market here was quiet and inactive, but wholesale prices advanced in sympathy with a rise in London quotations, which advanced to the highest for the month. The market closed very firm on the strength of a steady reduction of available stocks and the fact that the nearby expected arrivals are well under control. Straits Pig in small lots from stock is firm at 19c. per lb. The arrivals thus far this month amount to but 1225 tons, with 3346 tons afloat.

**Copper.**—Prices here have shown an upward tendency, although only a comparatively small business has been done this week. It is said, however, that a large quantity of Lake Ingot was sold for delivery in the first two months of the new year. Sellers are holding very firm, and quotations for small lots continue at about 13½c. to 13¾c. for Lake Ingot and 12¾c. to 13c. for Ansonia Grade Casting Copper. The exports for December have reached 5831 tons to date.

**Sheet Copper.**—The spot demand is limited, as is usual at the close of the year, but a good volume of inquiry gives the promise of good business ahead. Manufacturers and jobbers are holding firmly to the advanced price for Sheet Copper announced last week, retail sales being made on the basis of 16½c. to 17c. per lb, net, according to quantity.

**Pig Lead.**—A distinctly stronger tone has been developed in this metal, with an active demand for early deliveries. Offerings, too, are reserved and prices, in consequence, have stiffened perceptibly. Jobbers' prices for small lots of American Pig are very firm at 4c. to 4¼c. per lb.

St. Louis reports Pig Lead strong and in active demand.

**Spelter.**—This metal has been dull, with a slow demand, but prices have remained firm, shipments from the West being retarded and the stock here being very small. For small retail quantities 5½c. to 5¾c. is quoted. The Ore market declined slightly during the week, and is expected to recede still further.

St. Louis advices report no disposition to place heavy orders for Spelter, and, although it is not freely offered, the market is dragging.

**Sheet Zinc.**—A moderate business is reported. Jobbers' prices are firm at 7c. per lb. of 600-lb. cask lots, and 7¼c. for smaller quantities.

**Antimony.**—While Hallett's has shown a slight weakness, the market as a whole remains with little or no change from a week ago. Small parcels of Cookson's are quoted at 10c. to 10¼c. per lb., Hallett's at 9½c., and United States at about the same figure.

**Nickel.**—The market has advanced materially, and small retail lots are now quoted at 41c. per lb.

**Aluminum.**—An active demand is noted for this metal. Prices remain as before. No. 1 Aluminum guaranteed over 99 per cent. pure in Rolling Ingots is quoted in small lots at 40c. per lb.; 100 lb. lots, 36c.; No. 2 Ingot guaranteed over 90 per cent. pure is quoted in small lots at 34c. per lb; 100-lb. lots, 33c., and Special Casting Alloy, containing over 80 per cent. pure Aluminum, used in place of Brass, 35c. per lb.; 100 lb. lots, 30c. per lb.

**Tin Plate.**—Business here is stagnant, owing to the approach of the end of the year and to the uncertainties regarding the policy of the consolidation on prices. The trade is looking forward with the keenest interest to the decision of the Executive Committee of the American Tin Plate Company, who were in session in Chicago at the

close of the week. The dealers here are holding up high prices, and consumers generally show no inclination to purchase beyond the limits of their actual present requirements. The larger buyers are holding off until they can get some inkling as to the probable course of the market under the new management. A number of mills were restarted this week on the completion of their inventories, in order to fill contracts on their books, but none of them are taking fresh orders. The market is very strong, but prices are largely nominal. The following represent about the present prices asked for small retail lots of American Plates for spot delivery at New York, Philadelphia and Baltimore: American Coke Tins, IC, 108 lbs., 14 x 20, Bessemer Steel, \$3.45; ditto, 100 lbs., \$3 35; ditto, 95 lbs., \$3.30; ditto, 90 lbs., \$3 25; American Charcoal Brights, Melyn Grade, IC., 14 x 20, \$4.45; Allaway Grade, IC, 14 x 20, \$3.95; American Charcoal Ternes, IC, 14 x 20, ordinary, \$3 20. Stocks in dealers' hands are becoming rather broken up, and there is some likelihood of a shortage in certain lines.

Chicago advices are as follows: The American Tin Plate Company have not yet decided what they will do with regard to prices. The Executive Committee met the latter part of the week to take up this question, and in the meanwhile the works which have been started will run on accumulated orders. Jobbers have had a seasonable demand, but not a particularly heavy business.

**Sheet Iron.**—There is a very good business passing, considering that the close of the year is so near at hand. Inquiry for Black Sheets is fairly active, some large consumers asking for prices on round lots for delivery during the first half of next year. A number of mills show an inclination to turn down business of this kind, in the expectation that buyers will take more kindly to an advance after the first of the year than they would at present. On the other hand, the Sheet market continues to be disturbed by low quotations sent out by one or two mills that have gone after business very aggressively. The demand for Galvanized Sheets is very good, and the market for this material shows considerable strength. Jobbers' prices in this section continue, for small lots from stock, at 2.35c. to 2.40c. for No. 27 Common Black Sheets and 80 per cent. off for Galvanized Sheets.

Chicago advices are as follows: Large inquiries have been received for Black Sheets for three to six months' delivery. Important consuming interests are expected shortly to be in the market for 5000 tons or more. Prices at present are on the same low level as before, but it is expected that the prospects in sight will have a little stimulating effect on the mills. Good sales have been made of Galvanized Sheets. Jobbers quote small lots of No. 27 Black at 2.10c. to 2.20c., and Galvanized at 80 and 5 per cent. off.

**Old Metals.**—The market has shown rather more life, and prices, while unchanged, are as a rule firmer. Yard dealers in this city and vicinity are paying about the following rates, delivered at New York:

|  |               |
|--|---------------|
| Heavy Copper.....                      | per lb. 10½c. |
| Light and Tinned Copper.....           | per lb. 10¼c. |
| Heavy Brass.....                       | per lb. 7½c.  |
| Light Brass.....                       | per lb. 7¼c.  |
| Lead.....                              | per lb. 3½c.  |
| Tea Lead.....                          | per lb. 3¼c.  |
| Zinc.....                              | per lb. 3½c.  |
| Zinc Dross in Slabs.....               | per lb. 3½c.  |
| No. 1 Pewter.....                      | per lb. 10c.  |
| No. 2 Pewter.....                      | per lb. 6½c.  |
| Wrought Scrap Iron, per gross ton..... | \$8.25        |
| Heavy Cast Scrap, per gross ton.....   | 8.00          |
| Stove Plate Scrap, per gross ton.....  | 5.25          |
| Burnt Iron, per gross ton.....         | 3.25          |
| Tin Plate Scrap, per ton.....          | 3.50          |



THE IRON MARKET.

The year 1898, with its extraordinary record for production, closes with a burst of activity unparalleled in the history of the industry, except in the famous year 1879. An enormous tonnage has been placed for 1899 delivery, but at very low prices. An increasing number of producers, having their order books in good shape for many months to come, are virtually withdrawing from the market or are asking higher prices.

The Western markets for Foundry Irons have been comparatively quiet during the past week, but there has been continued activity in the East, where the furnaces had been relatively lower for some time past. These furnaces now have advanced prices and are calling a halt.

There has not been much doing in Steel, East or West. Makers of Billets are firm on the basis of \$16 Pittsburgh and \$17.35 to \$17.50 in Eastern Pennsylvania. Buyers, however, are resisting the advance. To what extent and in what manner the Tin Plate consolidation has control of the supply of Tin Plate Bars has not transpired. It is regarded as probable that some arrangement must have been made.

In a few lines prices are still irregular and there is complaint of cutting prices in Sheets.

**Pig Iron.**—There has been quite an active business, the Pennsylvania, New York and Virginia furnaces participating in it, while the Alabama furnaces are virtually out of the market. Among the sales was one lot of 5000 tons to a stove maker, and considerable blocks to other larger consumers. Buyers have quite generally availed themselves of what options they had at lower prices. Lehigh Valley furnaces now quote, at tidewater: No. 1 X Foundry, \$11.75; No. 2 X, \$11.25; No. 2 Soft, \$11; No. 2 Plain, \$10.75; No. 3 Foundry, \$10.50. Southern brands, tidewater delivery, are nominally: No. 1, \$11.25 to \$11.50; No. 2, \$11 to \$11.25; No. 1 Soft, \$11 to \$11.25; No. 2, \$10.75 to \$11.

Reports from Philadelphia indicate that the Pig Iron market in that district is strong and probably very much oversold. Sales during the past ten days have been unusually large, and buyers are still clamoring for more. Sellers are disposed to withdraw from the market pending further developments, and it is possible, and is indeed hoped, that buyers will accept this view of the situation, as it would be a misfortune to advance prices prematurely. The stiffening in prices during the past few days has been more particularly in Mill Irons and in those for Steel making, which have made quite an advance, although all grades show an upward tendency. Sales amount to a total almost unprecedented, prices being within about the following limits for seaboard deliveries, with the usual rebate to points within a radius of 100 miles South or West: No. 1 X Foundry, \$12 to \$12.50; No. 2 X Foundry, \$11 to \$11.25; No. 2 Plain, \$10.60 to \$10.75.

In Chicago sales of Southern Iron have been quite heavy, but the tonnage was not so large as that of the previous week. This is partly because not so much iron is available. Sales agents have much trouble in meeting the views of buyers on deliveries. Furnaces will not sell beyond July 1, with present fine prospects, and it is difficult to find one which is not completely sold up for delivery during the early months of the coming year. Consumers are taking up all options given them on Southern Iron previous to the last advance, while numerous sales are reported at full figures. Inquiries are numerous for additional lots of Northern and Southern Iron, and the buying movement is by no means ended. We quote for cash as follows:

|                                   |                    |
|-----------------------------------|--------------------|
| Lake Superior Charcoal.....       | \$11.50 to \$13.50 |
| Local Coke Foundry, No. 1.....    | 11.50 to 12.50     |
| Local Coke Foundry, No. 2.....    | 11.00 to 12.00     |
| Local Coke Foundry, No. 3.....    | 10.50 to 11.50     |
| Local Scotch, No. 1.....          | 11.50 to 13.00     |
| Ohio Strong Softeners, No. 1..... | 12.00 to 12.50     |
| Southern Silvery.....             | 11.00 to 12.00     |
| Southern Coke, No. 1.....         | 11.35 to 11.50     |
| Southern Coke, No. 2.....         | 11.10 to 11.25     |
| Southern Coke, No. 3.....         | 10.75 to 10.85     |
| Southern, No. 1 Soft.....         | 11.35 to 11.50     |
| Southern, No. 2 Soft.....         | 11.10 to 11.25     |

Foundry Iron continues quiet on the Pittsburgh market. We quote: No. 1 Foundry, \$10.50 to \$10.75; No. 2 Foundry, \$10 to \$10.25; Bessemer, \$10.60 to \$10.75, f.o.b. Pittsburgh.

The Cincinnati Pig Iron market is reported as very strong, with a good run of 500 to 1000 ton orders, and at the same time a continuation of the smaller transactions. There are plenty of inquiries in the field, and it looks as if there will be considerable Iron sold during the next ten days. The feeling in all circles that Iron is going higher is gaining strength daily, and another advance within the next 60 days is confidently expected. Northern Iron is selling well, and the market is good. There is yet very little Iron offered at the minimum quotations, but the maximum figures indicate the real condition of the market. Quotations f.o.b. at Cincinnati are as follows:

|                                |                    |
|--------------------------------|--------------------|
| Southern Coke, No. 1.....      | \$10.25 to \$10.50 |
| Southern Coke, No. 2.....      | 10.00 to 10.25     |
| Southern Coke, No. 3.....      | 9.50 to 9.75       |
| Southern Coke, No. 1 Soft..... | 10.25 to 10.50     |
| Southern Coke, No. 2 Soft..... | 10.00 to 10.25     |
| Southern Coke, Gray Forge..... | 9.10 to 9.25       |
| Southern Coke, Mottled.....    | 9.00 to 9.25       |
| Ohio Silvery, No. 1.....       | 12.25 to 12.75     |
| Ohio Silvery, No. 2.....       | 11.75 to 12.25     |
| Lake Superior Coke, No. 1..... | ..... to 11.50     |
| Lake Superior Coke, No. 2..... | ..... to 11.00     |

The St. Louis market continues firm at the advanced prices, and despite the near approach of stock taking operations the demands are for prompt fulfillment of contracts instead of requests to apply unused portions on next year's account. Good round lots of Pig Iron have been taken at present prices, and as some of these buyers made purchases less than two weeks ago for 1899 wants and at the lower figures then prevailing, the assumption is that the condition of the trade warrants a stiffening in quotations. We quote as follows for cash, f.o.b. cars St. Louis:

|                              |                    |
|------------------------------|--------------------|
| Southern, No. 1 Foundry..... | \$11.00 to \$11.25 |
| Southern, No. 2 Foundry..... | 10.50 to 10.75     |
| Southern, No. 3 Foundry..... | 10.00 to 10.25     |
| No. 1 Soft.....              | 10.75 to 11.00     |
| No. 2 Soft.....              | 10.50 to 10.75     |

CHICAGO REPORT.

**Old Metals.**—The demand is much better for all grades. Yard dealers' carload buying prices are as follows, Chicago delivery:

|  | Per net ton.                | Per lb.      |
|--|-----------------------------|--------------|
| Country Wrought Scrap.....               | \$8.50 to \$9.00            |              |
| Machinery Cast.....                      | 7.75                        | ....         |
| Malleable Cast.....                      | 7.00                        | ....         |
| Stove Plate (free of burnt).....         | 5.50                        | ....         |
| Burnt Iron and Grate Bars.....           | 3.50                        | ....         |
| Sheet Iron and Hoops.....                | 3.50                        | ....         |
| Plow Steel and Breaking Stock....        | 4.00                        | ....         |
| No. 2, such as Shovels, Hoes, &c... 3.50 | ....                        | ....         |
| Old Boilers—whole (Iron).....            | 5.00                        | ....         |
| Old Boilers (Iron)—cut in single         |                             |              |
| Sheets and Rings.....                    | 6.50                        | ....         |
| Old Gas Pipe and Boiler Tubes....        | 5.50                        | ....         |
| Cast Borings.....                        | 3.50                        | ....         |
| Turnings.....                            | 5.00                        | ....         |
| Horseshoes.....                          | 8.50                        | ....         |
| Copper Wire and Heavy.....               | ....                        | 11 c.        |
| Copper Bottoms.....                      | ....                        | 10 c.        |
| Copper Clips.....                        | ....                        | 10¾ c.       |
| Red Brass.....                           | ....                        | 10 c.        |
| Yellow Brass.....                        | ....                        | 8 c.         |
| Light Brass.....                         | ....                        | 5¾ c.        |
| Pipe Lead.....                           | ....                        | 3.30         |
| Tea Lead.....                            | ....                        | 3 c.         |
| Zinc.....                                | ....                        | 4 c.         |
| Rubber.....                              | ....                        | 4 c.         |
| Inside Bicycle Tubing.....               | ....                        | 10c. to 12c. |
| Outside Tubing.....                      | ....                        | 4c. to 4½ c. |
| Garden Hose.....                         | \$10.00 to \$12.00 net ton. |              |
| Air Brake Hose.....                      | 20.00 to 22.00 net ton.     |              |

**Anthracite.**—Nothing new is reported. The schedule on carload lots of 12 tons minimum is as follows:

|                           | Egg, Sto. | Grate, and Ch. |
|---------------------------|-----------|----------------|
| Chicago, Ill.....         | \$4.25    | \$4.50         |
| Milwaukee, Wis.....       | 4.25      | 4.50           |
| Kansas City, Mo.....      | 6.25      | 6.50           |
| Council Bluffs, Iowa..... | 6.25      | 6.50           |
| Lincoln, Neb.....         | 6.40      | 6.65           |
| Sioux City, Iowa.....     | 6.75      | 7.00           |
| Aberdeen, S. Dak.....     | 7.50      | 7.75           |
| Dubuque, Iowa.....        | 5.55      | 5.80           |
| Madison, Wis.....         | 5.75      | 6.00           |
| St. Paul, Minn.....       | 6.75      | 7.00           |
| Burlington, Iowa.....     | 5.75      | 6.00           |
| Des Moines, Iowa.....     | 6.25      | 6.50           |
| Davenport, Iowa.....      | 5.55      | 5.80           |
| St. Joseph, Mo.....       | 6.25      | 6.50           |
| Leavenworth, Kan.....     | 6.25      | 6.50           |
| Omaha, Neb.....           | 6.25      | 6.50           |



*Colorado Anthracite.*

## COLORADO FUEL &amp; IRON COMPANY.

|  |        |
|--|--------|
| Denver.....                                  | \$5.75 |
| Pueblo.....                                  | 5.75   |
| Colorado Springs.....                        | 5.75   |
| Leadville.....                               | 5.75   |
| Cheyenne, Wyo.....                           | 6.75   |
| All points between Denver and Missouri River | 6.75   |

## THE HARDWARE TRADE.

THERE continues to be an excellent demand in many lines, and while the holiday business is naturally attracting a good deal of attention, and winter goods are moving freely, and in some cases developing a scarcity, there is a good deal of activity which has not yet shown itself in shipments. There is no doubt that the larger trade are buying more freely than usual at this season to cover their future wants, and many stock orders for next season are being booked. The firmness which prevails in some staple lines, together with exceedingly favorable conditions, tend to give the confidence which justifies such purchases. Meanwhile trade questions continue to attract attention, and business men are interested in watching the changes which are taking place in trade and endeavoring to realize what the outcome is to be, and how they are wisely to adapt themselves to the present trend of things. One of these questions is touched upon in the correspondence given in the following pages, in which merchants express themselves as to the policy recently announced by a prominent Sporting Goods house, who will hereafter cultivate direct and apparently almost exclusive relations with the retail trade.

There is probably no one question which is occupying the thoughts of business men more than that of the possibility of an advance in prices. There are some indications pointing to a strong advancing market, and an approach at least to the experience of 1879 is among the possibilities of the near future. The future certainly seems bright with hope. The cause of sound money appears to have won a decisive victory; our export business is constantly enlarging our market, while our home demand continues unprecedented, and the restoration of public confidence is complete and entire. Such conditions are those under which it is a possibility that prices may not be restrained within moderate bounds and an old fashioned boom developed. Fortunately there is another side to this, for a boom in prices, with its subsequent relapse, is the one thing that at present we should most fear. There have been permanent changes in the business situation and in many business methods which operate against such temporary convulsions. Placing our currency upon a solid foundation must act as a check upon undue speculation, since our periods of inflation and subsequent collapse have generally been the direct results of a disordered currency. The broadening of our commercial field tends likewise to eliminate those periods of "feasts and famines" and to cause traffic to flow in regular and more uniform channels. There is, moreover, among manufacturers a very strong opposition to any save the most conservative advances, and to such as can be sustained. It is true that there are many lines which are too low and which must advance if the makers are to continue in business, but in general there does not seem to be much ground for apprehending one of those disastrous upheavals of prices such as we have experienced in the past. If profits are to be permanently smaller, then there is good reason for believing that they will be more uniform, and that the era of prosperity, if less pronounced, will extend over a longer period.

*Chicago.*—December business in Shelf Hardware will run well ahead of that of last December, although what was considered a phenomenal trade for the season was then enjoyed. A good business has been done in all kinds of holiday goods, but the character of the trade is otherwise without any special feature, as retailers are buying

assorted orders, showing that all kinds of merchandise are being freely marketed. Country merchants are also carrying much better stocks than they have been in the habit of doing for the past four or five years, although they are still acting more cautiously than in the good old days before the era of low prices. The time is now at hand when travelers will visit the home house, and it is likely that more or less quietness will be felt until after the turn of the year. Some ambitious salesmen will, however, continue to pile up orders until they are absolutely compelled to come in. Heavy Hardware jobbers report their trade in very good condition. Jobbers believe that consumers will be clamoring for all kinds of goods in the spring months.

*St. Louis.*—The same good feeling noted last week in the Hardware trade exists at the present time and jobbers' shipments are not confined to winter lines. Activity is demanded in completion of orders and inquiries from all sources indicate a comfortable volume of sales for the early months of next year. The new possessions of the United States are already proving of commercial value to St. Louis, as within ten days a jobbing house in Heavy Hardware have secured the largest single order in the history of their long established business for shipment to the islands in the Pacific.

## NOTES ON PRICES.

**Cast Iron Soil Pipe.**—At a meeting of the Soil Pipe Manufacturers' Association held December 15 existing prices on Cast Iron Soil Pipe and Fittings were reaffirmed. It was agreed that these prices should hold good until February 1, 1899. The following are the prices to plumbers as fixed by the Association for Pipe and Fittings from 2 to 6 inch inclusive:

|                   | Per cent.               |
|-------------------|-------------------------|
| Standard.....     | .75 and 75 and 5        |
| Extra Heavy.....  | .75 and 75 and 10 and 5 |
| All Fittings..... | .75 and 10 and 80       |

These discounts apply to the trade price list of June 15, 1896. While all of the manufacturers of these goods are not members of the association, as a rule those outside keep near the prices laid down by the association.

**Wire Cloth and Poultry Netting.**—There continues to be a good deal of activity in these lines, and the competition for trade is decidedly animated. Manufacturers are making low prices, and the retail merchants are getting the advantage of them, as their business is solicited by both jobbers and manufacturers at low figures, shipments to be made as desired, with liberal terms of payment, freight allowance, &c.

**Soldering Copper.**—The higher prices reached by raw Copper have brought with them an advance in the price of Soldering Copper, amounting to about 1 cent a pound. Jobbers quote Soldering Coppers at 18 to 19 cents per pound.

**Wire Nails.**—The year draws to a close with exceedingly satisfactory conditions prevailing in the Wire Nail market. There is a liberal movement of goods and at the same time, without any formal concert of action, prices are decidedly firm and somewhat higher.

*New York.*—The local demand for Wire Nails is good but not especially heavy. The trade recognizes the firmness of the market and this has the effect of inducing merchants to buy more freely than they otherwise would in view of the near approach of the annual inventory and the turn of the year. Export business continues in good volume. Small lots from store are quoted at \$1.50.

*Chicago.*—Manufacturers have enjoyed a very good demand in the past week and are much encouraged by the character of the inquiries now being received. They expect an immense business next year, which will surpass any previous year. Jobbers have had a fair demand from stock and continue to quote \$1.40 for small lots, but will shortly be obliged to make an advance to correspond with that made by the manufacturers.

*St. Louis.*—There is a radical improvement in the



demand, which comes much in the nature of a surprise to jobbers, who ordinarily do not look for any heavy sales during December. Prices are firm and there is talk of an advance of at least 5 cents per keg before the week is out. We quote \$1.55 to \$1.57½ for small lots from store.

**Cut Nails.**—In sympathy with Wire Nails a good tone prevails in the Cut Nail market, but prices are unchanged.

**New York.**—A moderate business is doing in Cut Nails. Quotations remain as before, small lots from store selling at \$1.33 to \$1.35.

**Chicago.**—Jobbers quote small lots of Cut Nails at \$1.35 and report a steady demand, which varies but little from week to week.

**St. Louis.**—There is no change to note in Cut Nails. Jobbers quote \$1.35, base, for small lots from stock.

**Barb Wire.**—The Barb Wire market is characterized in general by the features which prevail in Wire Nails, there being a decidedly hopeful feeling and a somewhat firmer market. The volume of business is not heavy, but a large trade is anticipated during the coming season. It is thought that the export demand will assume a large volume.

**New York.**—The Barb Wire market for the territory adjacent to New York is characterized by a very moderate demand, the trade apparently deferring their purchases until after the opening of the new year. Export business continues in excellent shape and the indications point to a good and continued demand. Prices remain as at our last report: Four Point Galvanized in small lots from store being quoted at \$1.90 to \$1.95.

**Chicago.**—Manufacturers have had a good demand and the leading companies report that they are preferring not to take a large amount of business for spring delivery at present prices. They have made a slight advance during the week. Jobbers quote small lots of Painted at \$1.52½ and Galvanized at \$1.87½, with Plain Smooth Wire at \$1.30.

**St. Louis.**—While the demand has not shown any marked improvement there is a decidedly better tone as regards prices. Jobbers ask \$1.60 to \$1.62½ for Painted and \$1.95 to \$1.97½, Galvanized.

**White Lead.**—The demand for White Lead in Oil in small quantities for immediate use keeps up remarkably well for this season of the year. Otherwise the market is without particular interest and prices remain at 6½ cents per pound for retail quantities.

**Red Lead.**—Present requirements for Red Lead are limited, but with more business in sight after the first of the year. Prices remain unchanged.

**Linseed Oil.**—The American Linseed Oil Company have not yet put any Oil on the market. This company, including as they do a number of the former independent crushers whose product is not now for sale, make Oil somewhat scarce. What the new company will do regarding the future price of Oil is a matter of speculation. The price of Seed continues relatively higher than the price of Oil, without any change in the latter and with but a moderate amount of business being done.

**Spirits Turpentine.**—An advance in the price of Turpentine of 3 cents has taken place since our last issue. Buyers have come in the market more freely, but are limiting their purchases to immediate requirements. The unusually large demand during the past year has resulted in low stocks. Persons thoroughly familiar with the market think that Turpentine has not reached its highest price, although there may be temporary reactions.

**Old Rubber.**—The demand is fair. Local dealers are paying about the following figures:

|  |            |
|--|------------|
| Car Springs, ton lots, per lb                        | 3½ c.      |
| Rubber Shoes, carloads, delivered at factory, per lb | 4¾ to 5 c. |
| Rubber Shoes, less than carloads, per lb             | 4.70c.     |
| White Wringer Rolls, per lb                          | 4 c.       |
| White Syringes, per lb                               | 4 c.       |

**Old Rags, Paper, &c.**—The market is quiet and prices show no quotable change. Local dealers are paying about the following rates for New York City delivery:

|                           |         |             |
|---------------------------|---------|-------------|
| No. 1 White Rags          | per lb. | 2½ to 2¾ c. |
| No. 2 White Rags          | per lb. | 1½ to 1¾ c. |
| Mixed Rags                | per lb. | 1 c.        |
| Blues and 3ds             | per lb. | 1 c.        |
| Hard Sized White Shaving  | per lb. | 1½ to 2 c.  |
| No. 1 White Book Shavings | per lb. | 1½ c.       |
| No. 2 White Book Shavings | per lb. | ¾ to 1 c.   |
| Light Book Shavings       | per lb. | ¾ to ¾ c.   |
| No. 1 Mixed Shavings      | per lb. | ¾ to ¾ c.   |
| No. 2 Mixed Shavings      | per lb. | ¾ to ¾ c.   |
| No. 1 Printed Books       | per lb. | ¾ to 1 c.   |
| Ordinary Mixed Books      | per lb. | ¾ c.        |
| Newspapers                | per lb. | ¾ to ¾ c.   |
| No. 1 Manila Paper        | per lb. | ¾ to ¾ c.   |
| No. 2 Manila Paper        | per lb. | ¾ to ¾ c.   |
| Bogus Paper               | per lb. | ¾ c.        |
| Common Paper              | per lb. | ¾ to ¾ c.   |
| Straw Chips               | per lb. | ¾ c.        |
| Binders' Clippings        | per lb. | ¾ c.        |
| Jute Butts                | per lb. | 1½ to 1¾ c. |
| No. 1 Jute Bagging        | per lb. | ¾ to 1 c.   |
| Mixed Bagging             | per lb. | ¾ to ¾ c.   |
| No. 2 Bagging             | per lb. | ¾ to ¾ c.   |
| Hemp Twine                | per lb. | 1½ to 1¾ c. |
| Manila Rope               | per lb. | 1½ to 2 c.  |
| Jute Rope                 | per lb. | 1½ to 1¾ c. |
| Mixed Rope                | per lb. | ¾ to ¾ c.   |

### X-Rays in the Army.

BY H. LYMAN SAYEN.

When the operations of the army near Santiago indicated the necessity of providing for the wounded in the United States, where better care, more healthful surroundings and better food could be obtained than was possible in Cuba, the Government selected Fort McPherson, Ga., as one of the receiving points. Situated 4 miles southwest of Atlanta, on a table land 1000 feet above the sea level, its pure air and water, excellent sanitary arrangements and central position in the South made it an excellent site for a general hospital for the army in the field.

Early in July I was ordered by Surgeon-General Sternberg to report for duty at the post in connection with X-ray work. Upon my arrival there I found that the finely equipped post hospital was used partly as an executive building and partly for sick and wounded officers. Immediately adjoining the hospital building is the laboratory building, one portion of which was the surgical operating room, well equipped with modern surgical appliances, while another part of the building was devoted to the biological laboratory, and it was here that the X-ray work was done.

The room was well suited to the work, and, as the water supplied to it was from an artesian well over 2000 feet deep, it offered exceptional facilities for the developing and printing. I had the shutters covered with an opaque black oilcloth in order that the room might be made absolutely dark, even when the brightest daylight prevailed outside. It was found very essential to do this, not only for photographic purposes, but for the fact that it seems impossible to do satisfactory work in daylight. It is a matter of ten minutes or so for the eyes to accommodate themselves to the fluoroscope after being exposed to daylight, and it is impossible to keep them glued in the fluoroscope and at the same time manipulate the X-ray apparatus in a light room.

The original equipment of the X-ray laboratory contained as a generator an eight-plate static machine with plates 28 inches in diameter, running in ball bearings. The plates were in a moisture proof case, which also contained a double-plate Wimshurst as an exciter. The main plates were driven by a large hand wheel which made one turn to four or five of the plates.

The apparatus was of excellent workmanship and, under conditions less exacting than this instance, might have performed the work required of it. While the writer's experience in the use of the static machine in connection with the generation of X-rays has been somewhat limited, a study of the conditions existing in this form of machine, together with the actual working of the apparatus at the post, leads to the conclusion that the static machine is theoretically and practically an inefficient current generator, aside from the fact that the highly humid Southern climate rarely permitted its use in this particular instance.

A static machine depends for its excitation on the potential induced at its terminals, and as a consequence, when running at a low potential, as on a tube of low vacuum, it does not generate a sufficient quantity of current. The addition of a spark gap in series with the tube improves the output of the machine, but there is more energy lost in the spark gap than used in the tube. That is, if the machine is not running at a potential equivalent



to a long spark, it will not generate enough current to properly illuminate the tube. A tube with a vacuum corresponding to a parallel spark gap of about 8 inches gives the most satisfactory results. When connected to a static machine, in order to get enough current through the tube it is necessary to add a spark gap in series with it about 6 inches long. It will be seen from this that the machine, in order to give the proper current, generates three times the energy necessary; or, in other words, a 4-inch spark from an induction coil would do the same work, while the apparatus required would occupy but about one-twentieth of the space.

In view of the exigencies of the work Queen & Co., Philadelphia, kindly loaned the writer a 14-inch induction coil, together with a number of their self regulating tubes, while Dr. T. P. Hinman of Atlanta volunteered the use of his laboratory for the purpose of charging the batteries to run the coil, no electrical plant existing at the post.

The wounded sent to the post included those who were in the fight at El Caney, and in practically every case the X-rays were employed for diagnostic purposes. The difficulty of obtaining suitable photographic plates early in the work compelled reliance upon the findings of the fluoroscope, the location of bullets being marked by ink spots on the flesh. In the case of fractures the surgeon in charge of the patient was enabled to verify the position of the bones.

The number of wounded during the war that required the X rays was by no means large, but the cases of injured received at Fort McPherson were of such a varied character as to fully emphasize the value of the new form of radiant energy in all field and hospital work during the war. While it is not in my province to comment on the surgical aspect of the subject I believe it to be the opinion of surgeons of experience that the older method of probing for bullets, with the consequent danger of carrying infection to the wounded parts, should be abandoned in favor of the X-rays. There is also the important factor of accuracy in the X ray determinations, enabling the surgeon to remove the bullet through a small opening in the tissues.

All the operations of the surgeons at the post were successful in removing the bullets from the exact location, as is indicated by the radiographs, and in many cases it was impossible to determine the nature of the injury except by means of the plates. The presence of some of the bullets was even unsuspected, as is shown by the case of J. R., private, Company C, Second Infantry. He was wounded at Santiago and arrived at McPherson with two pieces of lead in his arm. The presence of the larger piece was unsuspected, the smaller piece being so near the surface that recourse to the X-rays was considered unnecessary. A subsequent stiffness and soreness in the arm, however, gave rise to an X ray examination, resulting in the successful removal of the bullet.

The present war is the first instance that our army medical department has had occasion to use X ray apparatus to any practical extent. Apart from the novelty of the new force, there is not the opportunity in the army in time of peace to determine the value of improvements of this nature as is afforded the general hospitals.

The X-rays in the army are essentially an equipment for war, and in those times when the medical department is taxed to the utmost there is the utmost importance that they should have every facility to help in the successful treatment of the injured. Not only are the rays valuable from the standpoint of their immediate usefulness, but too much importance cannot be placed on the fact that, as records, there is nothing better or more accurate than a radiograph. In the case of J. R., should he try to obtain a pension, could there be found any better evidence of the fact that his bones are uninjured and that the possibilities of a permanent injury resulting are exceedingly small? If, together with the radiograph, there is kept an accurate history of the different cases, we have an indisputable account of the effect of gunshot injuries.

It certainly seems that the recent developments in the design of X-ray apparatus have advanced it to such a state that there are great possibilities for the adaptation of it to work in the field. A covered wagon, drawn by two mules, would furnish the dark room as well as the means of conveyance. It should be in charge of two men who should be so trained in the work that they would, between them, know how to take care of everything from the secondary of the induction coil to the hoofs of the mules. In the wagon might be placed a 12-inch induction coil so made that every part could be immediately removed and replaced by another, of which the wagon should contain a complete set. It should also contain, besides a complete supply of tubes and photographic apparatus, a little dynamo and windlass so the mules could put in their spare time in charging the storage batteries (although this seldom has to be done, as my experience at Fort McPherson demonstrated). A thousand pounds would cover the weight of the apparatus, and with such an equipment the wagon would be as independent as a company of infantry. The operators could bunk in their ambulance

besides carrying a plentiful supply of rations.—*Electrical World.*

## TRADE NOTES.

With the compliments of the Indiana Wire Fence Company, Crawfordsville, Ind., manufacturers of Barbed Wire, Wire Nails and Woven Wire Fencing, &c., we have received a calendar for 1899 in the form of a hanger bearing a brightly colored "portrait of a lady." Calendar sheets are affixed below and the name of the company and their products printed on the top and on either side.

"Graphite" is the title of a new publication which is issued by the Joseph Dixon Crucible Company, Jersey City, N. J., in the interest of their Graphite productions, and for the purpose of establishing a better understanding in regard to the different forms of Graphite and their respective uses. It will be sent out monthly.

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# ROOFING SUPPLIES, METALS, TIN PLATES, &c.

REVISED DECEMBER 23, 1893.

The following quotations are for small lots:

## Aluminum—

|   |         |                      |
|---|---------|----------------------|
| No. 1 Aluminum (guaranteed over 99% Pure), in ingots for remelting. | Per lb. | 40¢                  |
| Small lots.   | Per lb. | 38¢                  |
| 100-lb. lots.   | Per lb. | 36¢                  |
| Aluminum Rods, from 1/4-in. diam. to 2 in. diam.                    | Per lb. | 53¢                  |
| Aluminum Sheet, B. & S. gauge.                                      | Per lb. | 53¢                  |
| Wider than 14-in. 24-in.  | Per lb. | 53¢                  |
| And including 14-in. 24-in.   | Per lb. | 50-in.               |
| Nos. 13 to 19.  | Per lb. | \$0.38 \$0.40 \$0.43 |
| " 20.   | Per lb. | .40 .42 .45          |
| " 21 to 23.   | Per lb. | .42 .44 .47          |
| " 24.   | Per lb. | .42 .44 .49          |
| " 25.   | Per lb. | .43 .47 .50          |
| " 26.   | Per lb. | .43 .50 .53          |
| " 27.   | Per lb. | .44 .53 .58          |
| " 28.   | Per lb. | .44 .53 .60          |
| " 29.   | Per lb. | .45 .56 .65          |
| " 30.   | Per lb. | .46 .60 .73          |

## Antimony—

|           |         |           |
|-----------|---------|-----------|
| Cookson.  | Per lb. | 10@10 1/2 |
| Ballet's. | Per lb. | 9 1/2     |
| U. S.     | Per lb. | 9 1/2     |

## Brass—Planished.

Roll and Sheet ..... 30¢ off

## Brass and Copper Tubes

### Brazed Brass Tubing—

Brown &amp; Sharpe's Gauge the Standard.

List Feb. 26, 1896.

### Plain Round Tube.

Per lb.

1/4-in. up to 1/2-in. .... \$0.35

1/2-in. up to 3/4-in. .... .38

3/4-in. up to 1-in. .... .38

1-in. up to 1 1/4-in. .... .41

1 1/4-in. up to 1 1/2-in. .... .48

1 1/2-in. up to 1 3/4-in. .... .65

1 3/4-in. up to 2-in. .... 1.00

2-in. up to 2 1/2-in. .... 1.50

2 1/2-in. up to 3-in. .... Special

3-in. and larger. .... Special

8-in. to 3-in. to No. 10, inclusive. 38

## Copper & Bronze Tubing—

3¢ per lb. more than Brass.

## Conductors—

Corrugated. Round or Square.

Galvanized, Nested. .... 80%

Not Nested. .... 80%

Locked Joints, Nested. .... 80%

Not Nested. .... 80%

Tin. .... 70%

## Spiral Riveted.

Galvanized. .... 50%

See also Elbows and Shoes; Eave Trough Miters; Strainers, Conductor.

## Conductor Strainers—See

Strainers, Conductor.

## Copper—

Bottoms, Pits and Flats 20 1/2¢ basis

Ingot.

Lake. .... 13 1/2@13 3/4

Ansonia Grade Casting. .... 12 1/2@13

Planished. .... net

Sheet and Bolt. .... 16 1/2¢ basis

## Tubes—See Seamless Brass Tubes

## Eave Troughs—

List Feb. 1, 1895.

Lap or Slip Joint, Galvanized. .... 80@10 1/2

Lap or Slip Joint, Terne. .... 65

## Eave Trough Mitres—

Lap or Slip Joint. .... List, 25

## Elbows—Plain Adjustable—

Tin. .... 70@10 1/2

Galvanized. .... 80%

## Crimped Tubing.

Retinned or Galvanized. .... 85

## Stove Pipe—

Buffalo Four-Piece

4 1/2 5 6 7-inch.

No. 1. 60. 70. 77. 82. 87. 1.05 per doz.

No. 2. .61 .66 .71 .74

## Elbows and Shoes—

Flat Crimp.

Tin. .... 35%

Galvanized. .... 85%

## Corrugated Flat Crimp.

Galvanized. .... 70@5 1/2

Round or Square.

Tin. .... 70@5 1/2

Galvanized. .... 70@5 1/2

## Gasoline—See Petroleum Products.

## Iron, Sheet—Black.

Common R. G. Cleaned

American. .... 2.25

Nos. 10 to 16. .... 2.00

Nos. 17 to 21. .... 2.10

Nos. 22 to 24. .... 2.20

Nos. 25 and 26. .... 2.30

No. 27. .... 2.40

No. 28. .... 2.50

American B. B. .... 2.75

Russia, Planished, &amp;c.

Genuine Russia, accord-

ing to assortment. .... 10@10 1/2

Do, Stained. .... 8@10

Patent Planished 1/2 in. A. 9 1/2; B. 8 1/2

Patent Planished Sheet Steel. .... 8 1/2

Galvanized.

Nos. 10 to 16. .... 12 1/2

Nos. 17 to 21. .... 13 1/2

Nos. 22 to 24. .... 14 1/2

Nos. 25 to 26. .... 15 1/2

No. 27. .... 16 1/2

No. 28. .... 17 1/2

No. 29. .... 18 1/2

No. 30. .... 19 1/2

36 in. 1 1/2 in. higher

## Kerosene—See Petroleum Products

## Lead—

American Pig. .... 4@4 1/2

Bar. .... 6

Pipe (full coils and lengths). .... 20%

Pipe (cut coils and lengths). .... 20%

Tin Lined Pipe. .... 12 1/2

Block Tin Pipe. .... 25

Sheet (full rolls). .... 20%

Sheets (cut rolls). .... 20%

Old Lead in exchange. 3 1/2

## Mitres, Eave Trough—See

Eave Trough Mitres.

## Nickel—

Per lb. .... 41

## Paints, Oils, &c.—

Lead, White, Atlantic and Jewett's.

100@500 lb. .... 6 1/2

Lead, Amn. White, in oil. .... 6 1/2

Lead, Red bbls. and 1/2 bbls. .... 6

Lead, Red, kgs. .... 6 1/2

Ochre, American. .... 1 1/2

Red Venetian, American. .... 1 1/2

Linseed Oil:

Raw, per gal. .... 39

Boiled. .... 41

Spirits Turpentine:

In bbls. .... 44

In cases. .... 52

Putty:

In barrels and 1/2 bbls. .... 13 1/2

In tubs. .... 13 1/2

In tin cans. .... 2 1/2

In bladders. .... 2 1/2

## Palm Oil. 1500 lb. casks.

Fancy Lago. .... 5 1/2

Clarified. .... 5 1/2

Acce. .... 5 1/2

Half Jack. .... 4 1/2

## Petroleum Products—

In Barrels (Barrel Included).

Stove Gasoline. .... 10@11 1/2

Kerosene. .... 8

## Pipe, Drain. .... 50%

## Pipe, Spiral—

Galvanized. .... 60%

Tin. .... 60%

## Registers—

List Dec. 20, 1897.

Black Japanned. .... 40@10 1/2

White Japanned. .... 30@10 1/2

Nickel Plated. .... 40@10 1/2

Bronze Finishes in Imitation of Gold.

Silver, Copper or Bronze. .... 40%

Electroplated in Brass, Bronze or

Copper. .... 40%

## Roofing Material—

Asphaltum, Trinidad Refined.

Per ton. .... \$30.00@35.00

Asphaltum, Rock. Per ton. .... \$14.00

Coal Tar Felt, 1 ply. Per 100 sq. ft. .... 2

2 Ply Roofing, per roll, 108 sq. ft. .... \$1.00

3 Ply Roofing, per roll, 108 sq. ft. .... 1.35

Roofing Pitch, per bbl. .... \$2.40@2.50

## Rosin—

(Barrels of 280 lb.)

Common and Good—Strained.

Rosin, C. &amp; D. .... bbl. \$1.37 @ \$1.38

Rosin, E. &amp; F. .... bbl. 1.40 @ 1.52 1/2

Rosin, G. &amp; H. .... bbl. 1.65 @ 1.70

Rosin, I. &amp; K. .... bbl. 1.72 1/2 @ 1.75

Rosin, M. &amp; N. .... bbl. 1.85 @ 2.15

## Seamless Brass Tubes—

Net List, Feb. 1, 1897.

## Shoes and Elbows—See El-

bows and Shoes.

## Slate Roofing—

According to size, f. o. b. cars, Quarry

Station.

Pennsylvania:

Best Bangor, per sq. .... \$3.50@4.50

No. 1 Bangor Ribboon. .... 3.00@3.25

Pen Argyle, per sq. .... 3.25@3.60

Peach Bottom, per sq. .... 4.75@5.00

No. 1 Chapman, per sq. .... 3.00@4.25

Lehigh Slates, per sq. .... 3.25@3.80

## Vermont:

Sea Green, per sq. .... \$2.15@2.75

Purple, per sq. .... 3.75@4.00

Variegated Purple. .... 2.25@2.90

Unfading Green, per sq. .... 3.50@4.00

Red, per sq. .... 8.50@10.50

## Solder and Soldering

Fluids—Solder—

1/2 lb. guaranteed. .... 12 1/2@12 3/4

No. 1. .... 11 1/2@11 3/4

Prices of Solder indicated by private

brands vary according to composition.

## Soldering Fluids—

Some Soldering Flux.

Per gal. .... 60

## Concentrated Soldering Flux.

f. o. b. New York.

In barrels. .... 4

Smaller quantities, per lb. .... 5

## Eureka Soldering Flux—Triple Strength.

In barrels. .... 3

Smaller quantities, per lb. .... 3 1/2

## Eureka Soldering Flux—Extra Con-

centrated.

In barrels. .... 4 1/2

Smaller quantities, per lb. .... 5

## Eureka Soldering Flux—Crystal.

In 100-lb. cases. .... 7

## Gedney's Soldering Fluid.

In carboys or barrels. .... 2

\$1.50 for carboy or barrel; money re-

funded when returned.

## Lennox Soldering Fluid.

In barrels. .... 2

In carboys. .... 3

## Perfection Soldering Flux.

No charge for package.

Bbls. about 500 lb. .... 3

1/2 bbls. about 800 lb. .... 3 1/2

Kgs. about 110 lb. .... 3 1/2

Kgs. about 55 lb. .... 4

## Fager's Soldering Salts.

1/2 lb. bottles, each. .... 80

Large quantities, per lb. .... 40

## Soldering Coppers—

Per lb. .... 18@19¢ net

## Spelter—

Western Spelter. .... 55@53 1/2

Bertha (pure). .... 8@8 1/2

## Spiral Pipe—See Pipe, Spiral.

## Stove Pipe Elbows—See El-

bows, Stove Pipe.

## Stove Trucks—See Trucks, Stove

## Strainers, Conductor—

Galvanized. .... 60%

## Tin Pigs and Bars—

Banca, Pigs. .... 19@19 1/2

Straits, pigs. .... 19

Straits, in bars. .... 19 1/2@20

## Tin Plates, American—

### Charcoal Plates, Bright—

N. B.—The price of 20 x 28 sizes is

double the price of 14 x 20.

Caland or IC, 10 x 14

Melyn Grade, IC, 14 x 20 ..... \$4.50

IX, 10 x 14 ..... 5.50

IX, 14 x 20 ..... 6.50

IXX, 14 x 20 ..... 7.50

IXXX, 14 x 20 ..... 8.50

IX, 12 1/2 x 17 ..... 4.25

IX, 12 1/2 x 17 ..... 5.25

Allaway Grade, IC, 10 x 14 ..... 4.00

IX, 10 x 14 ..... 4.75

IXX, 14 x 20 ..... 5.50

IXXX, 14 x 20 ..... 6.50

IXXX, 14 x 20 ..... 7.00

## Coke Plates, Bright—

Bessemer

Steel, or

equal to J, IC, 10 x 14 ..... \$3.50

B. Grade, 14 x 20 ..... 4.25

full weight



## ALPHABETICAL LIST OF ADVERTISERS.

|                                       |   |  |  |  |
|---------------------------------------|---|--|--|--|
| Adriance Machine Works... 75          | Colwell Lead Co..... 20                     | Hart & Crouse Co..... 24                       | Millar, Chas. & Son..... 76                    | Simmons, T. S..... 19                    |
| Etna-Standard Iron & Steel Co..... 67 | Connors, Wm..... 1                          | Highton, Wm. & Son..... 15                     | Miner & Peck Mfg. Co..... 75                   | Smith Co., H. B..... 10                  |
| American Corrugating Co... 68         | Cooney, Seiner & Co..... 64                 | Hill, Whitney & Wood Co... 62                  | Missouri Sheet Metal Ornament Co..... 68       | Souther, E. E. Iron Co..... 11           |
| American Pin Co..... 22               | Cope, Geo. W..... 16                        | Hoffman, Geo. W..... 17                        | Montross Metal Shingle Co.. 70                 | Special Notices..... 59                  |
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| Armstrong Mfg. Co..... 19             | Curtis & Curtis..... 19                     | Hull, M. L..... 22                             | National Pipe Bending Co.. 14                  | Standard Lighting Co ...12&1             |
| Atlanta Steel & Tin Plate Co. 70      | Dehn, Geo. J..... 21                        | Hungerford, U. T..... 60                       | New York Iron Roofing & Corrugating Co..... 68 | Stebbins, E. Mfg. Co ..... 20            |
| Atlas Bolt & Screw Co..... 17         | Dixon, Jos. Crucible Co..... 62             | Hussey, C. G. & Co..... 60                     | Niagara Machine & Tool Wks 75                  | Steel Bath Mfg. Co..... 18               |
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| Barstow Stove Co..... 76              | Duquesne Mfg. Co..... 20                    | Irondale Steel & Iron Co.... 75                | Ohl, Geo. A. & Co..... 74                      | Stover Mfg. Co..... 15                   |
| Bay State Aluminum Co.... 61          | Eastwood Wire Mfg. Co.... 1                 | I. X. L. Beer Pump Co..... 20                  | Omaha Stove Repair Works. 16                   | Stowell Mfg. & Foundry Co.. 15           |
| Beaver Tin Plate Co..... 67           | Eclipse Gas Stove Co..... 22                | Jackson's Sons, W..... 15                      | Osborn, J. M. & L. A..... 67                   | Sturtevant, B. F. Co..... 1              |
| Berger Bros. Co..... 64               | Eclipse Stove Co..... 6                     | Jenkins Bros..... 1                            | Ostrand, W. R. & Co..... 59                    | Sykes Iron & Steel Roofing Co..... 70    |
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| Bergstrom Bros. & Co..... 9           | Energy Mfg. Co..... 17                      | Keene, Geo. C. & Co..... 75                    | Penn Metal Ceiling & Roofing Co..... 70        | Troy Nickel Works.... 16                 |
| Berridge, T. & Son..... 72            | Ferracute Machine Co..... 72                | Kelsey Furnace Co..... 24                      | Presbrey Stove Lining Co... 16                 | Tubular Heating & Ventilating Co..... 10 |
| Bertsch & Co..... 74                  | Ferrosteel Co..... 1                        | Kemp, C. M. Mfg. Co..... 21                    | Proudman Bros..... 64                          | Universal Machine Co..... 72             |
| Blbb, B. C. Stove Co..... 6           | Follansbee Bros. Co..... 70                 | Kieckhefer Bros. Co..... 63                    | Richmond Stove Co..... 9                       | Valentine, M. D. & Bro. Co.. 16          |
| Bliss, E. W. Co..... 74               | Frink, I. P..... 76                         | Kieley, T..... 1                               | Ringen Stove Co..... 2                         | Vedder Pattern Works.... 16              |
| Blodgett, G. S. Co..... 7             | Front Rank Steel Furnace Co..... 15         | Kitson, Thomas..... 14                         | Rittinger-Rethey Co..... 20                    | Vogel, William & Bros ..... 62           |
| Boynton Furnace Co..... 9             | Galt, John & Sons..... 64                   | Koven, L. O. & Bro..... 17                     | Robinson, J. M. & Co..... 73                   | Washburne, E. G. & Co...64&63            |
| Brand Stove Co..... 11                | Garry Iron & Steel Roofing Co..... 68       | Lalanc & Grosjean Mfg. Co. 61                  | Rochester Stamping Works. 60                   | Wayne, Anthony Mfg. Co... 62             |
| Bray, J. & Co..... 64                 | Globe Ventilator Co..... 65                 | Lawrence-Letts Elbow Co.. 10                   | Rome Mfg. Co..... 60                           | Weir Stove Co..... 76                    |
| Bruce & Cook..... 66&76               | Gobelle Pattern Co..... 16                  | Litchfield, J. M..... 60                       | St. Louis Stamping Co..... 61                  | Wellsville Plate & Sheet Iron Co..... 70 |
| Burton, W. J. & Co..... 66            | Gordon, W. J..... 75                        | Lyon, Conklin & Co..... 72                     | Salem Nail Co.... 64                           | Wheeler, E. S. & Co..... 1               |
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| Champion Steel Range Co... 10         | Gumme, McFarland & Co... 67                 | Magee Furnace Co. ....1&3                      | Schratwiesers Metal Lath Works..... 64         | Wolff, L. Mfg. Co..... 19                |
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| Cleveland Rule & Handle Co..... 16    | Hanson & Van Winkle Co... 17                | Meurer Bros. Co..... 65                        |  |  |
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| Codling Mfg. Co..... 18               |   |  |  |  |
| Colt, J. B. & Co..... 18              |   |  |  |  |

IT WILL PAY TO GET OUR  
**Genuine Bangor**  
**Roofing Slate**

BEFORE PLACING YOUR ORDERS.

**BANGOR EXCELSIOR SLATE CO., - Easton, Pa.**

QUARRIES AT BANGOR, PA.



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Mechanical Engineering Construction Co., 63 5th Ave., N. Y.

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Lalanc & Grosjean Mfg. Co., 19 Cliff St., N. Y.

## Alloy Coating.

Steel & Iron Metal Coating Co., W. Chicago, Ill.

## Aluminum Coated Sheet Steel and Iron.

Steel & Iron Metal Coating Co., W. Chicago, Ill.

## Aluminum Ware.

Bay State Aluminum Co., Quincy, Mass.  
Hill, Whitney & Wood Co., Boston, Mass.

## Architectural Ornaments.

Missouri Sheet Metal Ornament Co., St. Louis, Mo.

## Asbestos.

Johns, H. W. Mfg. Co., 100 William St., N. Y.

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Peck Bros. & Co., New Haven, Conn.  
Steel Bath Mfg. Co., Detroit, Mich.

## Beer Pumps.

I. X. L. Beer Pump Co., Phila., Pa.

## Blower System.

Sturtevant, B. F. Co., Boston, Mass.

## Boiler Cleaners.

Dehn, Geo. J., Iron Mountain, Mich.

## Boilers, Range.

Wolff, L. Mfg. Co., Chicago, Ill.

## Brass Goods.

American Pin Co., Waterbury, Conn.

## Brass Sheets, Rolls, &c.

Hungerford, U. T., 121 Worth St., N. Y.  
Hussey, C. G. & Co., Pittsburgh, Pa.

## Brazers.

White Mfg. Co., Chicago, Ill.

## Can Makers' Tools and Machines.

Bliss, E. W. Co., Brooklyn, N. Y.  
Gordon, W. J., Phila., Pa.  
Niagara Machine & Tool Wks., Buffalo, N. Y.  
Robinson, J. M. & Co., Cincinnati, O.  
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## Ceiling Plates.

Codling Mfg. Co., Bristol, Conn.

## Ceilings, Metallic.

American Corrugating Co., St. Louis, Mo.  
Berger Mfg. Co., Canton, O.  
Canton Steel Roofing Co., Canton, O.  
Eller, J. H. & Co., Canton, O.  
Missouri Sheet Metal Ornament Co., St. Louis, Mo.  
New York Iron Roofing & Cor. Co., Jersey City, N. J.  
Northrop, H. S., 40 Cherry St., N. Y.  
Penn Metal Ceiling & Roofing Co., Phila., Pa.  
Souther, E. E. Iron Co., St. Louis, Mo.

## Cellar Drainers.

Kemp, C. M. Mfg. Co., Baltimore, Md.

## Cocks, Ball, Basin and Stop.

Stebbins, E. Mfg. Co., Brightwood, Mass.

## Coffee Mills.

Arcade Mfg. Co., Freeport, Ill.

## Coffee Pots.

Rochester Stamping Works, Rochester, N. Y.  
Rome Mfg. Co., Rome, N. Y.

## Coils.

National Pipe Bending Co., New Haven, Conn.

## Conductor Pipe and Elbows.

Berger Bros. Co., Philadelphia, Pa.  
Canton Steel Roofing Co., Canton, O.  
Cincinnati Corrugating Co., Piqua, O.  
Lawrence-Letts Elbow Co., Ltd., Waverly, N. Y.  
Lyon, Conklin & Co., Baltimore, Md.  
McClure & Co., Pittsburgh, Pa.  
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## Conductor Pipe Machinery.

Universal Machine Co., Canton, Ohio.

## Cooking Utensils.

Hill, Whitney & Wood Co., Boston, Mass.

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## Copperware Nickel Plated.

Rochester Stamping Works, Rochester, N. Y.  
Rome Mfg. Co., Rome, N. Y.

## Cornice Machinery.

Double Truss Cornice Brake Co., Buffalo, N. Y.  
Ferracute Machine Co., Bridgeton, N. J.  
Keene, Geo. O. & Co., Cincinnati, O.  
Ohl, Geo. A. & Co., Newark, N. J.  
Peck, Stow & Wilcox Co., 27 Murray St., New York.  
Robinson, J. M. & Co., Cincinnati, O.

## Cornice Work, Galvanized Iron.

Garry Iron & Steel Roofing Co., Cleveland, O.  
Marlin & Co., Pittsburgh, Pa.  
Northwestern Cornice & Mfg. Co., Chicago, Ill.

## Couplings. (See Pipe Couplers.)

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Johns, H. W. Mfg. Co., 100 William St., N. Y.

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Cooney, Seiner & Co., Indianapolis, Ind.  
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## Dampers.

Berger Bros. Co., Phila., Pa.  
Greene, W. F., Troy, N. Y.  
Troy Nickel Works, Troy, N. Y.

## Die Stocks.

Curtis & Curtis, Bridgeport, Ct.

## Drop Hammers.

Bliss, E. W. Co., Brooklyn, N. Y.

## Dumb Waiters.

Energy Mfg. Co., Phila., Pa.

## Eave Troughs.

Berger Bros. Co., Philadelphia, Pa.  
Berger Mfg. Co., Canton, O.  
Eller, J. H. & Co., Canton, O.  
Lyon, Conklin & Co., Baltimore, Md.  
Marlin & Co., Pittsburgh, Pa.  
Souther, E. E. Iron Co., St. Louis, Mo.

## Eave Trough Hangers.

Berger Mfg. Co., Canton, O.  
Proudman Bros., Meriden, Conn.

## Eave Trough Machines.

Marlin & Co., Pittsburgh, Pa.

## Eave Trough Machinery.

Universal Machine Co., Canton, Ohio.

## Elbows.

Lawrence-Letts Elbow Co., Ltd., Waverly, N. Y.  
Springfield Cornice Works, Springfield, Mass.

## Electric Dynamo Machines.

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Lalanc & Grosjean Mfg. Co., 19 Cliff St., N. Y.  
St. Louis Stamping Co., St. Louis, Mo.

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## Faucets.

Litchfield, J. M., Brooklyn, N. Y.

## Fire Brick.

Presbrey Stove Lining Co., Taunton, Mass.  
Valentine, M. D. & Bro. Co., Woodbridge, N. J.

## Fire Pots.

Clayton & Lambert Mfg. Co., Ypsilanti, Mich.  
Huill, M. L., Cleveland, O.

## Fire Sets.

Troy Nickel Works, Troy, N. Y.

## Floor Plates.

Codling Mfg. Co., Bristol, Conn.

## Food Cutters.

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## Furnace Cement, Asbestos.

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International Heater Co., Utica, N. Y.  
Schaffer, John P., Pittsburgh, Pa.  
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Bibb, E. C. Stove Co., Baltimore, Md.  
Brand Stove Co., Milwaukee, Wis.  
Chilson Furnace Co., Mansfield, Mass.  
Front Rank Steel Furnace Co., St. Louis, Mo.  
Hart & Crouse Co., Utica, N. Y.  
International Heater Co., Utica, N. Y.  
Kelsey Furnace Co., Syracuse, N. Y.  
Magee Furnace Co., Boston, Mass.  
Peck, Williamson Heating & Ventilating Co., Cincinnati, O.  
Richmond Stove Co., Norwich, Ct.  
Sheppard, Isaac A. & Co., Phila., Pa.  
Tubular Heating & Ventilating Co., Phila., Pa.

## Galvanized Ware.

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Gas Machines.

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Kemp, C. M. Mfg. Co., Baltimore, Md.

## Mechanical Engineering Construction Co., 63 5th Ave., N. Y.

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St. Louis Stamping Co., St. Louis, Mo.

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Jackson, W. Son, 246 Front St., N. Y.

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Whelan, Dennis J., Troy, N. Y.

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Arcade Mfg. Co., Freeport, Ill.

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Gurney Heater Mfg. Co., Boston, Mass.  
Hart & Crouse Co., Utica, N. Y.  
International Heater Co., Utica, N. Y.  
Magee Furnace Co., Boston, Mass.  
McLain, J. H. Co., Canton, O.  
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## Mica.

Munsell, Eugene & Co., 218 Water St., New York.  
No. Carolina Mica Co., Boston, Mass.

## Mica Chimneys and Canopies.

No. Carolina Mica Co., Boston, Mass.

## Milk Cans.

Kleckhefer Bros. Co., Milwaukee, Wis.

## Nickel Plating Outfits.

Hanson & Van Winkle Co., Newark, N. J.  
Zucker & Levett & Loeb Co., 526-530 W. Twenty-fifth St., New York.

## Oil Cans.

Berger Mfg. Co., Canton, O.

## Oil Heaters. (See Stoves and Ranges, Oil, Vapor and Gasoline.)

## Ovens, Portable.

Blodgett, G. S. Co., Burlington, Vt.

## Patent Solicitors.

Howson & Howson, Philadelphia, Pa.  
Stocking, E. B., Washington, D. C.

## Patterns.

Cope, Geo. W., Detroit, Mich.  
Gobelle Pattern Co., Cleveland, Ohio.  
Vedder Pattern Wks., Troy, N. Y.

## Pig Iron.

Wister, L. & R. Co., Philadelphia, Pa.

## Pipe Crimper.

Berridge, T. & Son, Sturgis, Mich.  
Wheeler, W. A., Indianapolis, Ind.

## Pipe Joint Grease.

Dixon, Jos. Crucible Co., Jersey City, N. J.

## Pipe, Water and Gas.

Millar, C. & Son, Utica, N. Y.

## Plumbers' Tools, Specialties and Supplies.

American Pin Co., Waterbury, Conn.  
Barstow Stove Co., Providence, R. I.  
Carter Valve & Brass Wks., Buffalo, N. Y.  
Clayton & Lambert Mfg. Co., Ypsilanti, Mich.  
Colwell Lead Co., 63 Centre St., N. Y.  
Graham, Chas., Chemical Pottery Works, Brooklyn, N. Y.  
National Pipe Bending Co., New Haven, Conn.  
Peck Bros. & Co., New Haven, Conn.  
Stebbins, E. Mfg. Co., Brightwood, Mass.  
Wheeler, E. S. & Co., New Haven, Ct.  
Wolff, L. Mfg. Co., Chicago, Ill.

## Pokers and Lifters.

Stover Mfg. Co., Freeport, Ill.  
Troy Nickel Works, Troy, N. Y.

## Potato Masher.

Vogel, Wm. & Bros., 37 to 47 S. 9th St., Brooklyn, N. Y.

## Presses and Dies.

Adriance Mach. Works, Brooklyn, N. Y.  
Bliss, E. W. Co., Brooklyn, N. Y.  
Ferracute Machine Co., Bridgeton, N. J.  
Gordon, W. J., Philadelphia, Pa.  
Miner & Peck Mfg. Co., New Haven, Conn.  
Niagara Machine & Tool Wks., Buffalo, N. Y.  
Robinson, J. M. & Co., Cincinnati, O.  
Rudolph & Krummel, Chicago, Ill.  
Stiles & Parker Press Co., Brooklyn, N. Y.

## Punching Machines.

Bertsch & Co., Cambridge City, Ind.  
Bliss, E. W. Co., Brooklyn, N. Y.  
Clough, R. M., Tolland, Conn.  
Robinson, J. M. & Co., Cincinnati, O.

## Radiators, Hot Air.

Backus Radiator Co., Cleveland, O.

## Radiators, Steam and Hot Water.

Gurney Heater Mfg. Co., Boston, Mass.  
Smith, H. B. Co., 185 Centre St., N. Y.

## Radiator Pedestals.

Atlas Radiator Pedestal Co., New London, Conn.

## Range Boilers.

Koven, L. O. & Bro., 18 Spruce St., N. Y.  
Rittinger-Rethy Co., 636 Columbus Ave., N. Y.  
Wolff, L. Mfg. Co., Chicago, Ill.

## Reflectors.

Frink, I. P., 551 Pearl St., New York.

## Refrigerators.

Gurney Refrigerator Co., Fond du Lac, Wis.

## Registers.

Ferrosteel Co., Cleveland, O.  
Highton, Wm. & Sons, Boston, Mass.  
Independent Register Co., Cleveland, Ohio.

## Roofing, Terne.

Atlanta Steel & Tin Plate Co., Atlanta, Ind.

## Roofing Cement and Paint.

Connors, Wm., Troy, N. Y.  
Dixon, Jos. Crucible Co., Jersey City, N. J.

## Roofing and Siding, Iron and Steel, Corrugated and Plain.

American Corrugating Co., St. Louis, Mo.  
Berger Mfg. Co., Canton, O.  
Burton, W. J. & Co., Detroit, Mich.  
Canton Steel Roofing Co., Canton, O.  
Cincinnati Corrugating Co., Piqua, O.  
Eller, J. H. & Co., Canton, O.  
Garry Iron & Steel Roofing Co., Cleveland, O.  
Gumme, McFarland & Co., Phila., Pa.  
Holt Iron Roofing Co., Lisbon, O.  
New York Iron Roofing & Cor. Co., Jersey City, N. J.  
Sykes Iron & Steel Roofing Co., Chicago, Ill.

## Roofing Machines.

Pocock, O., Cincinnati, O.

## Roofing Nails.

Salem Nail Co., 279 Pearl St., N. Y.

## Roofing Slate.



**Double Truss Cornice Brake Co.**, Buffalo, N. Y.  
**Ferracute Machine Co.**, Bridgeton, N. J.  
 Keene, Geo. C. & Co., Cincinnati, O.  
 Miner & Peck Mfg. Co., New Haven, Conn.  
**Niagara Machine & Tool Wks.**, Buffalo, N. Y.  
 Ohl, Geo. A. & Co., Newark, N. J.  
 Peck, Stow & Wilcox Co., 27 Murray St., New York.  
 Pocock, O., Cincinnati, O.  
 Robinson, J. M. & Co., Cincinnati, O.  
 Rudolph & Krummel, Chicago, Ill.  
 Stiles & Parker Press Co., Brooklyn, N. Y.  
 Universal Machine Co., Canton, Ohio.  
 Whelan, Dennis J., Troy, N. Y.

**Sheet Metal Ornaments.**

Missouri Sheet Metal Ornament Co., St. Louis, Mo.

**Sheets, Iron and Steel.**

Apollo Iron & Steel Co., Pittsburgh, Pa.  
 Aetna-Standard Iron & Steel Co., Bridgeport, O.  
 Bruce & Cook, 186 to 190 Water St., N. Y.  
 Cincinnati Corrugating Co., Piqua, O.  
 Follansbee Bros. Co., Pittsburgh, Pa.  
 Gummey, McFarland & Co., Phila., Pa.  
 Lyon, Conklin & Co., Baltimore, Md.  
 McCullough Iron Co., Wilmington, Del.  
 Morton Tin Plate Co., Cambridge, O.  
 Osborn, J. M. & L. A., Cleveland, O.  
 St. Louis Stamping Co., St. Louis, Mo.  
 Steel & Iron Metal Coating Co., W. Chicago, Ill.  
 Taylor, N. & G. Co., Philadelphia, Pa.  
 Wellsville Plate & Sheet Iron Co., Wellsville, O.  
 Wood, W. D. Co., McKeesport, Pa.  
 Wood Co., Alan, Philadelphia, Pa.

**Sheets, Galvanized.**

Aetna-Standard Iron & Steel Co., Bridgeport, O.  
 Apollo Iron & Steel Co., Pittsburgh, Pa.  
 Bruce & Cook, 186 to 190 Water St., N. Y.  
 Cinn. Corrugating Co., Piqua, Ohio.  
 McClure & Co., Pittsburgh, Pa.  
 McCullough Iron Co., Wilmington, Del.  
 Taylor, N. & G. Co., Philadelphia, Pa.  
 Wood Alan Co., Philadelphia, Pa.

**Shingles and Tiles, Metallic.**

Berger Mfg. Co., Canton, O.  
 Burden, W. J. & Co., Detroit, Mich.  
 Cincinnati Stamping Co., Cincinnati, O.  
 Cortright Metal Roofing Co., Philadelphia, Pa.  
 Meurer Bros. Co., Brooklyn, N. Y.  
 Montross Metal Shingle Co., Camden, N. J.

**Shot.**

Colwell Lead Co., 63 Centre St., N. Y.

**Siding.** (See Roofing and Siding.)**Skylights.**

Northwestern Cornice & Mfg. Co., Chicago, Ill.

**Slaters' Tools.**

Galt, Jno. & Sons, 253 Broadway, N. Y.  
 Salem Nail Co., 279 Pearl St., N. Y.

**Slitting Shears.**

Whelan, Dennis J., Troy, N. Y.

**Smoke Testing Machines.**

Hittinger-Rethy Co., 638 Columbus Ave., N. Y.

**Snow Guards.**

Halliday, M., East 9th St., N. Y.

**Solder.**

Bruce & Cook, 186 to 190 Water St., N. Y.  
 Follansbee Bros. Co., Pittsburgh, Pa.  
 Gummey, McFarland & Co., Phila., Pa.  
 McClure & Co., Pittsburgh, Pa.  
 Meurer Bros. Co., Brooklyn, N. Y.  
 Sanborn, J., 217 Water St., N. Y.  
 Taylor, N. & G. Co., Philadelphia, Pa.

**Soldering Copper Handles.**

Cleveland Rule & Handle Co., Cleveland, O.

**Soldering Furnaces.**

Eclipse Gas Stove Co., Rockford, Ill.  
 Hull, M. L., Cleveland, O.

**Soldering Irons.**

Hussey, C. G. & Co., Pittsburgh, Pa.

**Speaking Tubes and Whistles.**

Ostrander, W. R. & Co., 204 Fulton St., N. Y.

**Specialties, Sheet Metal.**

Vogel, Wm. & Bros., Brooklyn, N. Y.

**Steam and Gas Fitters' Supplies.**

Curtis & Curtis, Bridgeport, Conn.  
 Kleley, T., 7-11 West 18th St., N. Y.

**Steel.**

Hass, Wm. & Son, 355 W. B'way, N. Y.

**Steel Stamps and Stencil Dies.**

Schwerdtle & Siebert, Bridgeport, Ct.

**Stove Bolts.**

Atlas Bolt & Screw Co., Cleveland, O.

**Stove Linings.**

Marcy Stove Repair Co., 74 Beekman St., N. Y.

Presbrey Stove Lining Co., Taunton, Mass.

Valentine, M. D. & Bro. Co., Woodbridge, N. J.

**Stove and Metal Polish.**

Hoffman, Geo. W., Indianapolis, Ind.

**Stove Ornaments.**

American Pin Co., Waterbury, Conn.

**Stove Patterns.**

Cope, G. W., Detroit, Mich.  
 Gobeille Pattern Co., Cleveland, O.  
 Vedder Pattern Works, Troy, N. Y.

**Stove Pipe.**

Berger Bros. Co., Phila., Pa.

**Stove Putty.**

Connors, Wm., Troy, N. Y.

**Stove Repairs.**

Marcy Stove Repair Co., 74 Beekman St., N. Y.

Omaha Stove Repair Works, Omaha, Neb.

Troy Nickel Works, Troy, N. Y.

**Stove Trimmings, &c.**

Greene, W. F., Troy, N. Y.

Troy Nickel Works, Troy, N. Y.

**Stove Trucks.**

Arcade Mfg. Co., Freeport, Ill.  
 Howes, S. M. Co., Boston, Mass.  
 Mersick, C. S. & Co., New Haven, Conn.

**Stoves and Ranges.**

Bibb, B. C. Stove Co., Baltimore, Md.  
 Boynton Furnace Co., 207-209 Water St., N. Y.  
 Brand Stove Co., Milwaukee, Wis.  
 Century Stove Co., Dighton, Mass.  
 Champion Steel Range Co., Cleveland, Ohio.  
 Clad, V. & Sons, Phila., Pa.  
 Eclipse Stove Co., Mansfield, O.  
 Magee Furnace Co., Boston, Mass.  
 Michigan Stove Co., Chicago, Ill.  
 Richmond Stove Co., Norwich, Ct.  
 Ringen Stove Co., St. Louis, Mo.  
 Sheppard, Isaac A. & Co., Phila., Pa.  
 Weir Stove Co., Taunton, Mass.

**Stoves and Ranges, Gas.**

Dixon-Woods Co., Pittsburgh, Pa.  
 Eclipse Gas Stove Co., Rockford, Ill.  
 Ringen Stove Co., St. Louis, Mo.  
 Standard Lighting Co., Cleveland, O.

**Stoves and Ranges, Oil, Vapor and Gasoline.**

Barstow Stove Co., Providence, R. I.  
 Ringen Stove Co., St. Louis, Mo.  
 Standard Lighting Co., Cleveland, O.

**Tea Kettles.**

Hill-Whitney & Wood Co., Boston, Mass.  
 Rochester Stamping Wks., Rochester, N. Y.  
 Rome Mfg. Co., Rome, N. Y.

**Tea Pots.**

Rochester Stamping Works, Rochester, N. Y.

Rome Mfg. Co., Rome, N. Y.

**Tinners' Tools, Machines and Supplies.**

Berger, L. D., Philadelphia, Pa.  
 Berger Bros. Co., Phila., Pa.  
 Berridge, T. & Son, Sturgis, Mich.  
 Bertsch & Co., Cambridge City, Ind.  
 Bliss, E. W. Co., Brooklyn, N. Y.  
 Bruce & Cook, 186 to 190 Water St., New York.  
 Follansbee Bros. Co., Pittsburgh, Pa.  
 Keene, Geo. O. & Co., Cincinnati, O.  
 Niagara Machine & Tool Wks., Buffalo, N. Y.  
 Ohl, Geo. A. & Co., Newark, N. J.  
 Peck, Stow & Wilcox Co., 27 Murray St., New York.  
 Stiles & Parker Press Co., Brooklyn, N. Y.  
 Tinners' Machinery & Supply Co., 26 Cliff St., New York.

**Tinners' Trimmings.**

Vogel, Wm. & Bros. Brooklyn, N. Y.

**Tin Plate. (Mfrs. of.)**

Aetna-Standard Iron & Steel Co., Bridgeport, O.  
 Atlanta Steel & Tin Plate Co., Atlanta, Ind.

Beaver Tin Plate Co., Lisbon, Ohio.  
 Berger, L. D., Philadelphia, Pa.  
 Bruce & Cook, 186 to 190 Water St., New York.  
 Ellwood Tin Plate Co., Ellwood City, Pa.  
 Follansbee Bros. Co., Pittsburgh, Pa.  
 Gummey, McFarland & Co., Phila., Pa.  
 Irondale Steel & Iron Co., Richmond, Ind.  
 Lyon, Conklin & Co., Baltimore, Md.  
 McClure & Co., Pittsburgh, Pa.  
 Meurer Bros. Co., Brooklyn, N. Y.  
 Morton Tin Plate Co., Cambridge, Ohio.  
 Osborn, J. M. & L. A., Cleveland, Ohio.  
 Taylor, N. & G. Co., Philadelphia, Pa.

**Tinware.**

Keen & Hagerty Mfg. Co., Baltimore, Md.  
 Kleckhefer Bros. Co., Milwaukee, Wis.

**Tools and Machines, Steam and Gas Fitters'.**

Armstrong Mfg. Co., Bridgeport, Conn.  
 Curtis & Curtis, Bridgeport, Conn.  
 Saunders', D. Sons, Yonkers, N. Y.

**Torches, Plumbers.**

Clayton & Lambert Mfg. Co., Ypsilanti, Mich.

**Valves.**

Crosby Steam Gage & Valve Co., Boston, Mass.  
 Eastwood Wire Mfg. Co., Belleville, N. J.  
 Jenkins Bros., 71 John St., New York.

**Valves, Frost Proof.**

Casler Valve & Brass Works, Buffalo, N. Y.

**Ventilators and Chimney Caps.**

Canton Steel Roofing Co., Canton, O.  
 Globe Ventilator Co., Troy, N. Y.  
 Meurer Bros. Co., Brooklyn, N. Y.  
 Washburne, E. G. & Co., 46 Cortlandt St., New York.

**Washing Machines.**

Wayne, Anthony Mfg. Co., Fort Wayne, Ind.

**Washtubs.**

Keen & Hagerty Mfg. Co., Baltimore, Md.

**Washers, Valves, &c.**

Marston, I. G. & Co., Boston, Mass.

**Water Closets.**

Casler Valve & Brass Works, Buffalo, N. Y.

Colwell Lead Co., 63 Centre St., N. Y.

Peck Bros. & Co., New Haven, Conn.

Wheeler, E. S. & Co., New Haven, Ct.

Wolf, L. Mfg. Co., Chicago, Ill.

**Water Heaters.**

Clad, V. & Sons, Phila., Pa.

Duquesne Mfg. Co., Pittsburgh, Pa.

Kemp, C. M. Mfg. Co., Baltimore, Md.

**Wire Working Machinery.**

Rudolph & Krummel, Chicago, Ill.

SEE ALPHABETICAL INDEX, PAGE 55.

# THE METAL WORKER.

With which is Incorporated The Stove and Tin Trade Journal, The Sheet Metal Builder, and Metal.

Published Weekly at the Following Subscription Price:

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# LABOR EXCHANGE.

Notices under this heading of reasonable length are inserted free of charge. Only those relating to employment are admitted. Write distinctly on one side of paper only, and do not use postal cards.

Original letters of reference should not be inclosed with replies to advertisements appearing in these columns, as they are frequently mislaid and lost. A copy of the reference will serve the purpose.

## HELP WANTED.

SALESMAN calling on tinnerns and hardware trade in Western Iowa, Nebraska, Kansas and Missouri to sell tin plates and metal specialties on commission; local man preferred. "Good Line," office of *The Metal Worker*, 805 Fisher Building, Chicago, Ill. Dec. 24

One first-class PLUMBER, GAS, STEAM and HOT WATER WORKER; none but an experienced man need apply; state wages and experience. A. L. Cherry, 613 Crawford street, Portsmouth, Va. Dec. 24

A GENERAL OFFICE MAN for stove foundry. "Office Man," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Dec. 24

COPPERSMITHS wanted. Booth Copper Company, Limited, 123 Queen street, East Toronto, Ont. Dec. 24

A good, steady TINSMITH who can make or repair frame and mule cylinders and do all kinds of cotton mill work; steady job to the right man. S. M. Clark, Centreville, R. I. Dec. 24

A young man with three or four years' experience in plumbing; must be able to do job work; sober and industrious; state previous experience and ability. Pettit & Sanders, 407 Main street, Little Rock, Ark. Dec. 24

A boy or young man who has had some experience in steam supply house, who can assist in office and salesroom; must be qualified to write orders and make charges correctly and have some knowledge of goods handled. "Counting House," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 24

Four first-class STEAM PATTERN MAKERS and two PATTERN CARVERS. F. S. Weller Pattern Works, Quincy, Ill. Dec. 24

STEEL RANGE FOREMAN; one of practical experience and must be capable of managing help economically and to advantage; good, steady employment for right man; state experience, with whom now or last employed, wages and reference. "Steel Range Foreman," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 24

A competent man to prepare a course of instruction in sheet metal pattern drafting suitable for instruction by correspondence; applicant should have a thorough knowledge of both theory and practice, and be able to express his ideas clearly in writing; give full particulars, stating age, experience and salary expected. Box 534 office of *The Metal Worker*, 232-238 William street, New York City. Dec. 17

A TRAVELING SALESMAN to represent a factory manufacturing a line of oil, gas and vapor stoves; one having an established trade in Western Pennsylvania; must have good references as to ability and character. "X," office of *The Metal Worker* 232-238 William street, New York City. Dec. 17

A first-class SALESMAN for Missouri and Eastern Kansas; one for Southwest Iowa, Southeast Nebraska and Northeast Kansas; one for Northwest Iowa and Northeast Nebraska; state experience, with reference and salary desired. "S. S.," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Dec. 17

A man who can run a circular machine and a Geo. A. Ohl corncorn power brake; must furnish good references. "Machine," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 17

First-class working FOREMAN for cornice shop; must be thoroughly up in interior work, such as fancy metal ceilings, and capable of looking after a large number of men; must have a general knowledge of machine made work. The Pedlar Metal Roofing Company, Oshawa, Ontario, Canada. Dec. 17

A TRAVELING SALESMAN who is thoroughly acquainted with the stove business; one who has traveled through Pennsylvania, New Jersey and Delaware, and has a knowledge of gasoline and oil stoves; would pre-

fer a young man; reference required. "Lex," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 17

A first-class SALESMAN for New York City and adjacent country trade; give age, experience and references. "Country Trade," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 17

For season of 1899 SALESMAN with standing and acquaintance among stove trade in Western New York; state age, experience and give references. "Western," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 17

A New York house about to enter the building and contracting trade of that vicinity wants a first-class SALESMAN who can show standing with this class of trade and develop a good amount of business. "Standing," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 17

A middle aged, experienced man to take charge of plumbing, steam, hot water heating and gas fitting business of a long established retail house situated in New York State; business is on a solid foundation, with every facility; city of 25,000 inhabitants; to an energetic man, capable of estimating, drawing plans, managing departments and presentability to customers, who wants a life long position at good salary an excellent opportunity is offered; none other need apply. "Experienced," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 17

## SITUATIONS WANTED.

As clerk in a hardware store or in a shop as TINNER; 25 years' experience; understand all branches furnace, cornice work, &c.; can take charge of shop; references; South preferred. J. S. Hughes, 2100 East William street, Decatur, Ill. Dec. 24

By a PLUMBER, STEAM and GAS FITTER in any part of the State. P. Dunne, 395 Montgomery street, Jersey City, N. J. Dec. 24

As TRAVELING SALESMAN with some stove manufacturing by a practical stove man with 10 years' experience on the road; territory covered New England. E. A. Davis, Lock Box 12, Somerset, Mass. Dec. 24

By an experienced TRAVELING STOVE and FURNACE SALESMAN, acquainted with trade in New York, Pennsylvania, New Jersey, Connecticut and Ohio; 8 years with one house; good reference as to character and ability. "Salesman," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 24

As TRAVELING SALESMAN for cutlery house; have had five years' experience in the same; can give the best of reference and bond. Box 87, Lilly Chapel, Ohio. Dec. 24

By an Iron stove PATTERN FITTER; 30 years' experience; has had charge of men. Frank Dakin, 42 Fourth street, Elizabeth, N. J. Dec. 24

Young man, 28, desires a steady position in a tin shop; country preferred; best of references. Thos. Watts, Box 291, Matamoras, Pa. Dec. 24

By a first-class all round TINNER and FURNACEMAN; 11 years in jobbing shop; strictly temperate and honest; wants steady job; best of references; four years with last employer. Box 419, Watkins, N. J. Dec. 24

By a young man, 28 years old, thoroughly competent as a double entry BOOKKEEPER and OFFICE MANAGER of a plumbing or steam heating establishment; have had seven years' practical experience as a plumber and five years' experience as bookkeeper and office manager in same business; first-class city references. "E. F.," 2661 North Seventeenth street, Philadelphia, Pa. Dec. 24

TRAVELING SALESMAN open for position January 1; eight years' experience, New England territory, established trade; thorough acquaintance with all department stores, kitchen furnishing, wooden ware, hardware and house furnisners; finest references. "Reliable," office of *The Metal Worker*, 70 Kilby street, Boston, Mass. Dec. 24

As FOREMAN or MANAGER, by a practical heating and ventilating man of over 25 years' experience in managing help, making plans and contracting, with a general supervision of the business; references furnished. "Foreman, No. 1224," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 24

A steady position by a good all around man in a country shop; have had four and a half years' experience at all kinds of work in a country shop; can furnish reference. Fayette L. Archer, Copenhagen, N. Y. Dec. 24

By a practical all around TIN and SHEET IRON WORKER; 25 years' experience; understands stoves, cornice cutting, skylight work and raising; capable of taking charge of shop as working foreman. "R. E. X.," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 24

As TRAVELING or LOCAL SALESMAN, by an experienced stove and furnace man in either one or both lines; N. Y. State preferred; will travel on expense, commission basis. "Sales," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 24

By a mechanic of 25 years' experience in cornice, roofing and ceiling work, also hot air, dust pipe and factory work; honest, sober, industrious; good reference; situation as SUPERINTENDENT or FOREMAN; none but responsible firms need apply. C. J. Ferguson, Belle Centre, Logan County, Ohio. Dec. 24

By a young tinner as FOREMAN, or would take second place for a time with a view to promotion; have small tools; want a steady position. "R.," office of *The Metal Worker*, 805 Fisher Building, Chicago, Ill. Dec. 24

As FOREMAN and CUTTER in cornice and skylight shop, by a first-class cutter and draftsman; can estimate on all kinds of work and handle men to the best advantage; can give good references. Fred Nichols, 309 Hamburg avenue, Brooklyn, N. Y. Dec. 24

As CORNICE CUTTER or FOREMAN. "J. L.," 252 Franklin street, Philadelphia, Pa. Dec. 24

As SALESMAN for the coming year 1899; large acquaintance in Ohio and Indiana with stove, hardware and furniture dealers; good reference as to ability and character. "Ohio, No. 1224," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 24

As TRAVELING SALESMAN before February 1, 1899, with a house manufacturing or handling a complete line of tin plate; I have been on the road for the past 15 years and am well known by the trade in 10 States. "S. M. V.," 911 Hammond Building, Detroit, Mich. Dec. 24

By a good, reliable TIN and SHEET IRON WORKER of 15 years' experience at both inside and outside work; understands roofing, guttering, sheet iron and furnace work; would like a position with a reliable firm. P. O. Box 201, Pulaski, N. Y. Dec. 24

By a TINSMITH and HOT AIR WORKER; 15 years' experience; some knowledge of plumbing; country preferred; strictly temperate. W. A. Hewke, Port Jervis, N. Y. Dec. 24

By a first-class STOVE PATTERN FILER and FITTER. Richard Meissner, 135 West Michigan street, Evansville, Ind. Dec. 24

SUPERINTENDENT, FOREMAN or SALESMAN; have a practical knowledge of all details in the manufacturing of stoves and ranges; have been in the business some 20 years; can give the best of references. "Superintendent," 57 Broad street, Utica, N. Y. Dec. 24

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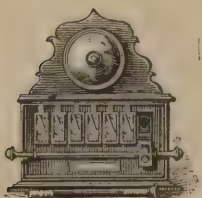
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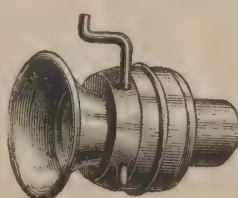
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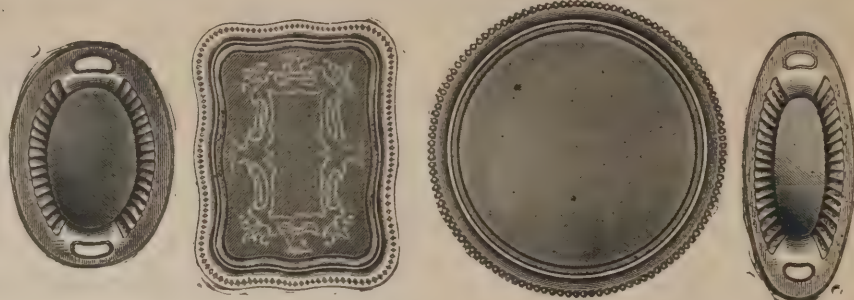
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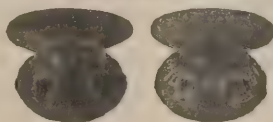
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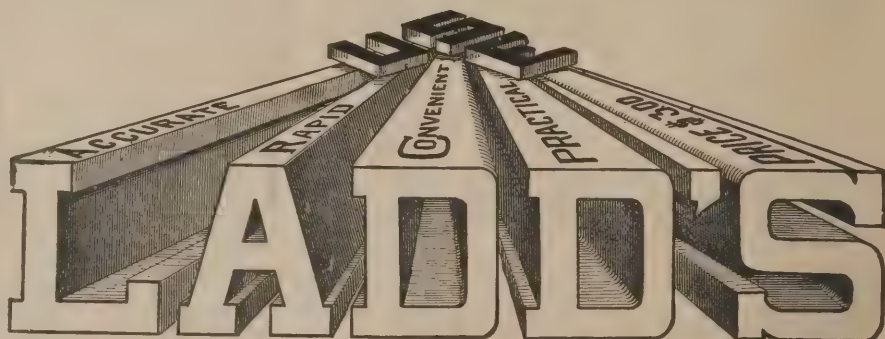
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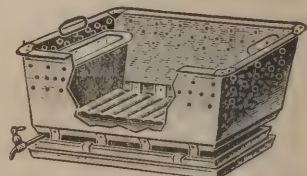
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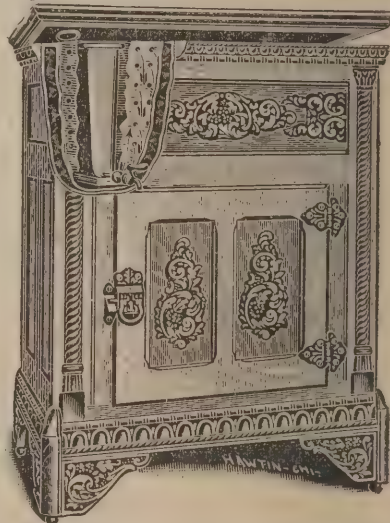
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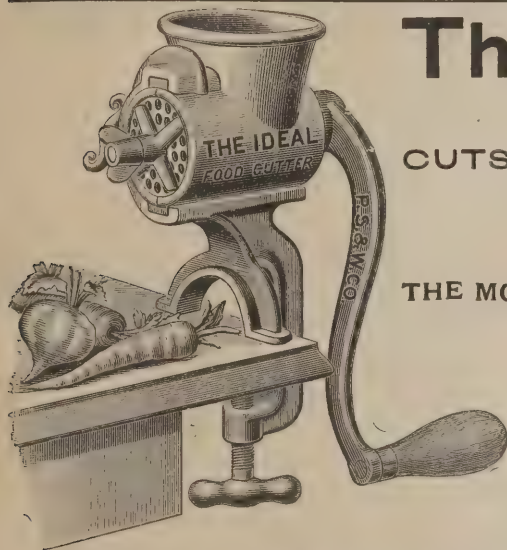
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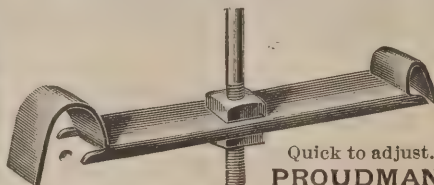
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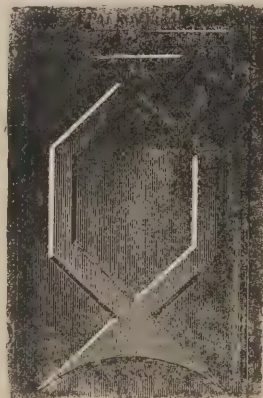


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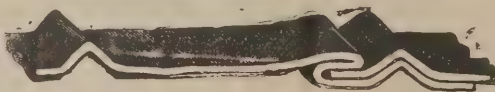
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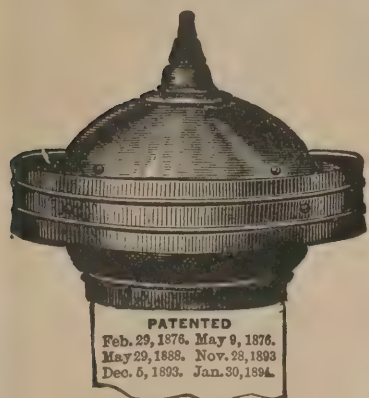
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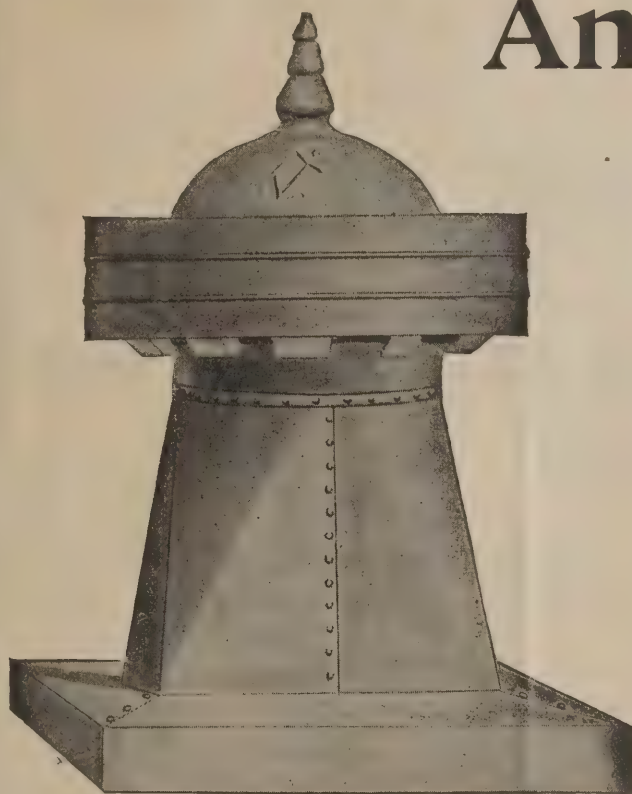
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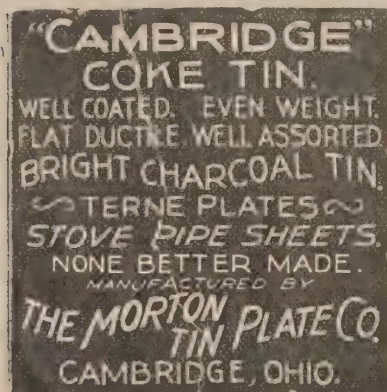
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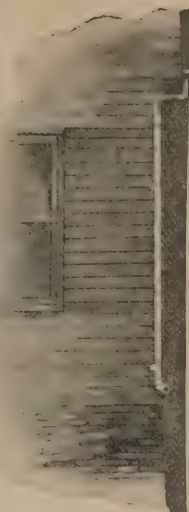
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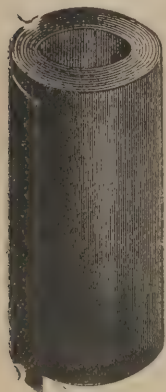
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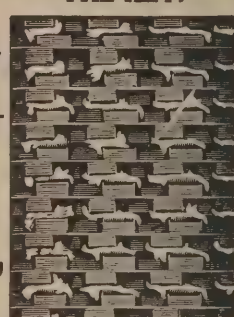


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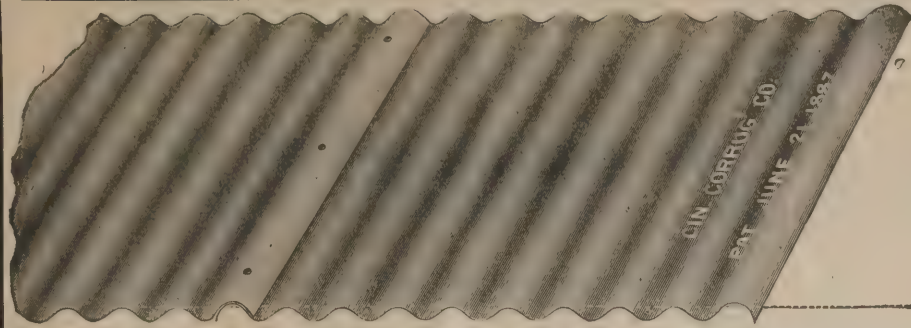
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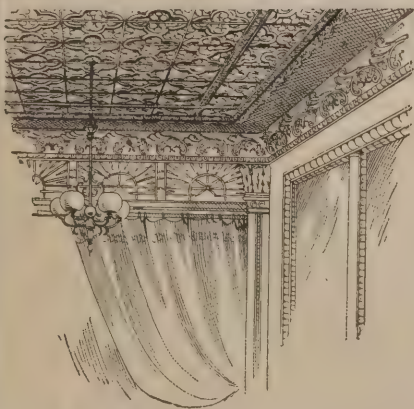
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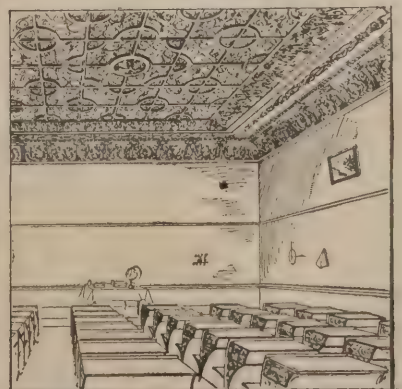
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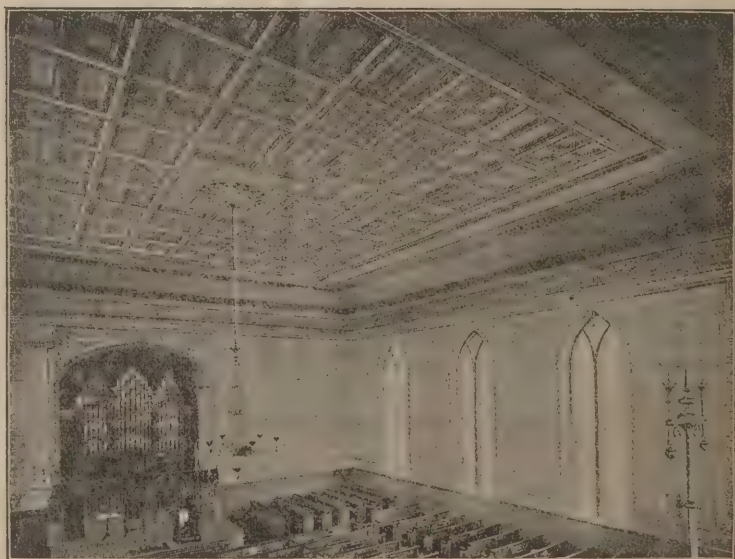
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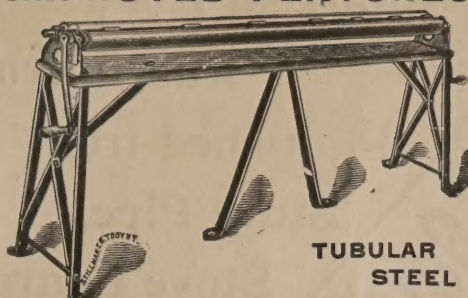
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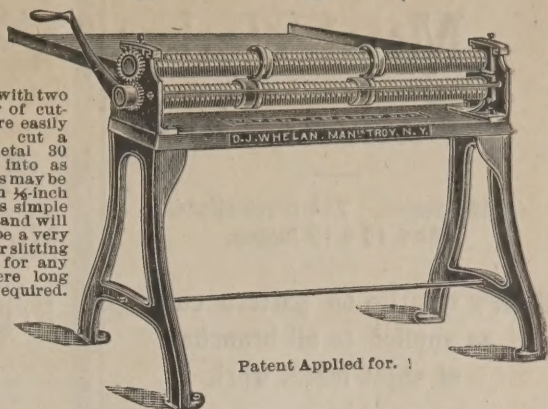
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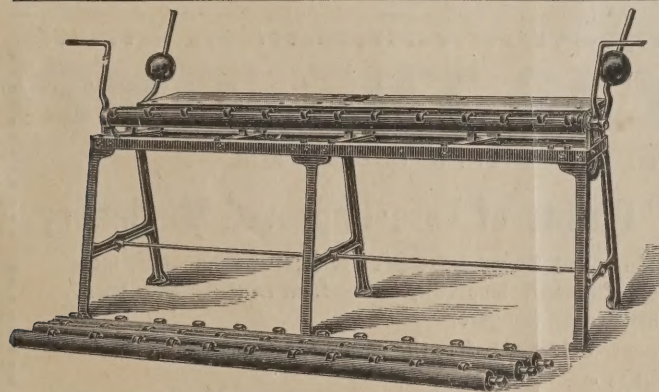
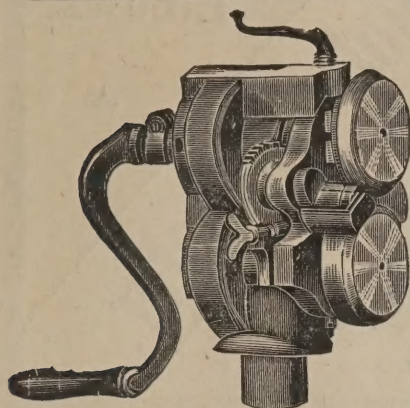
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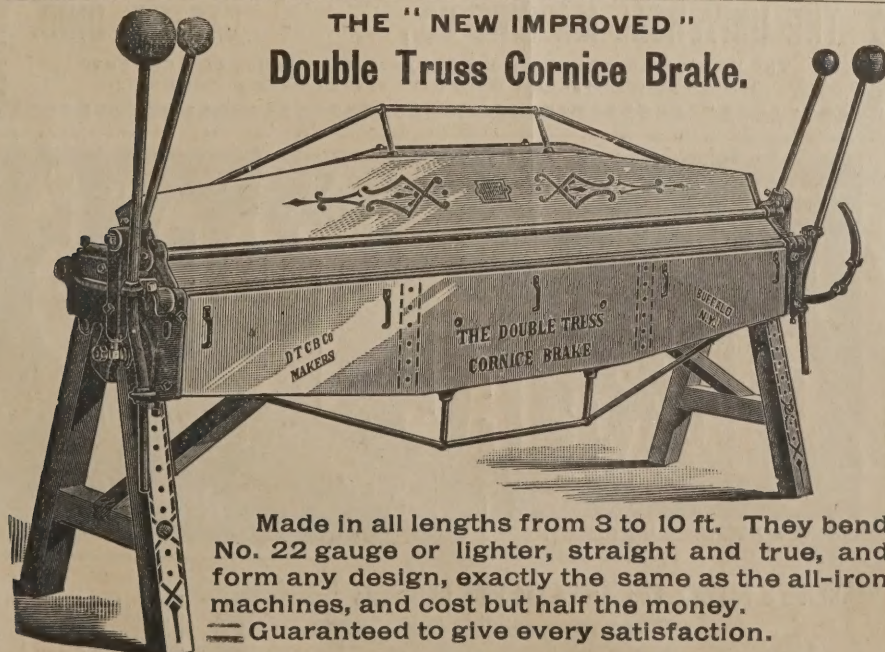
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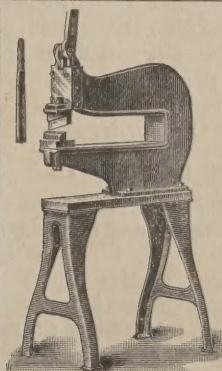
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Size 10 x 13 inches.

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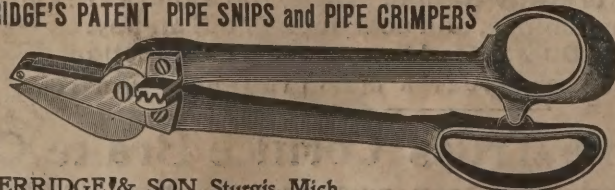
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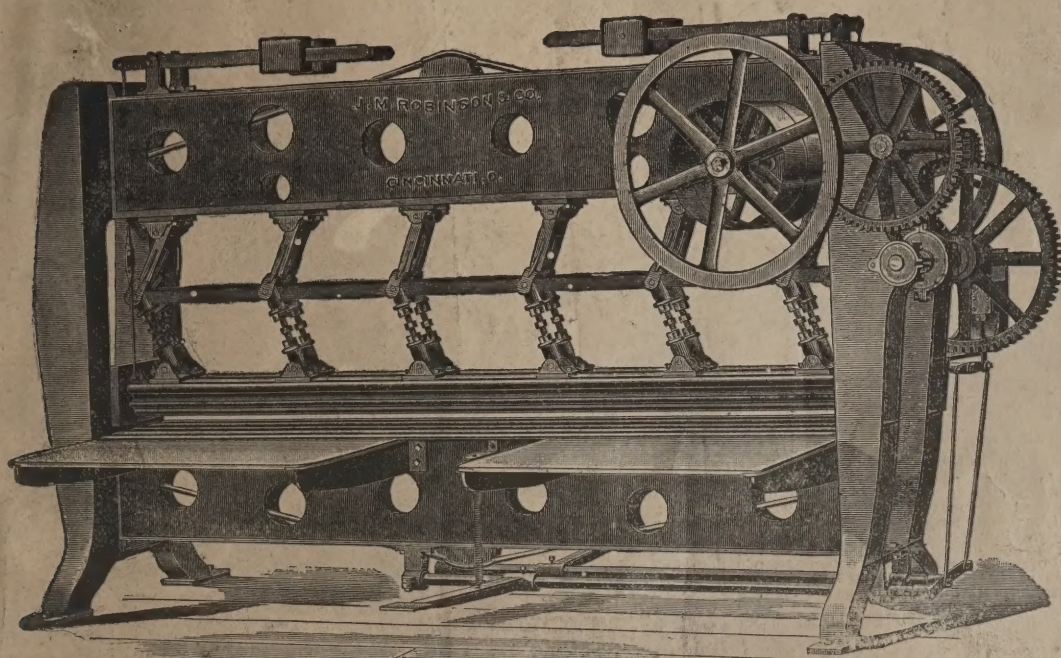


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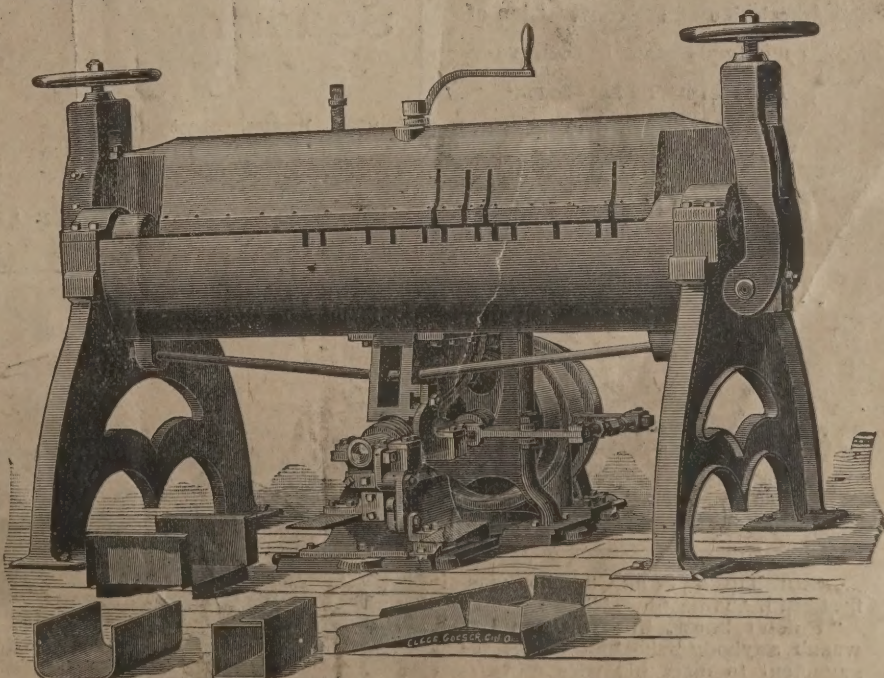
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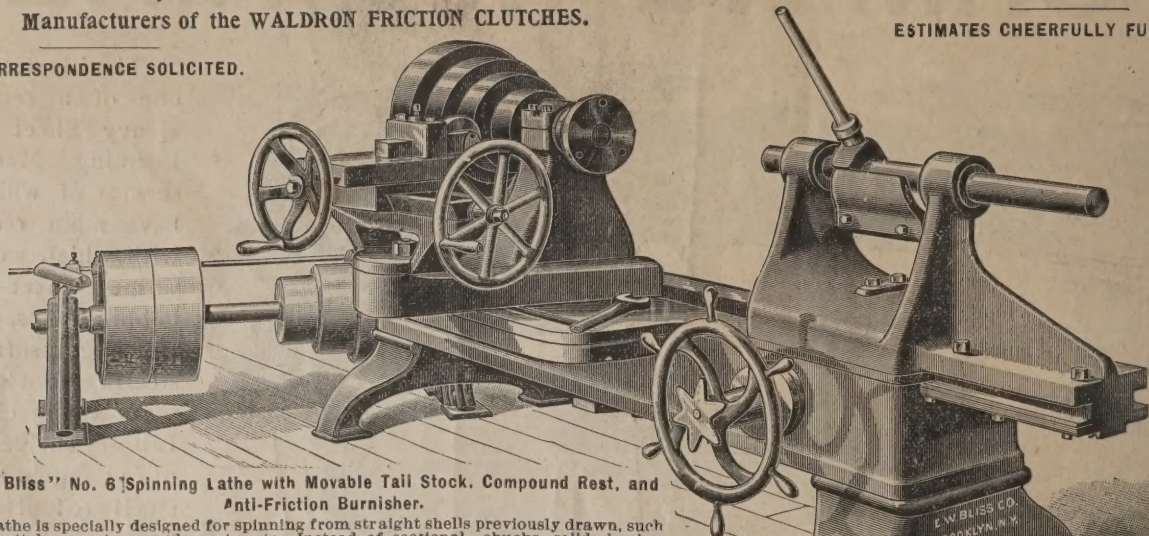
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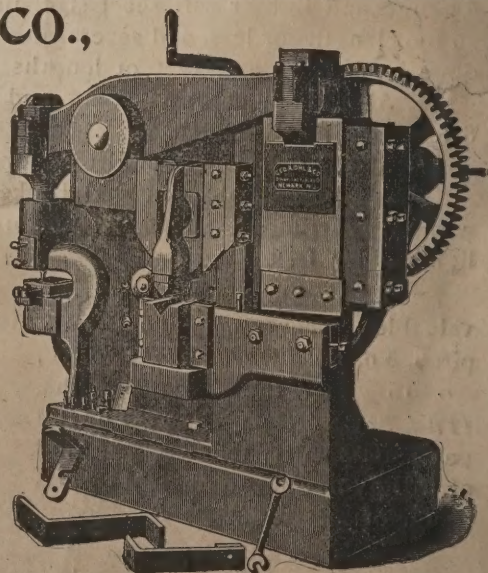
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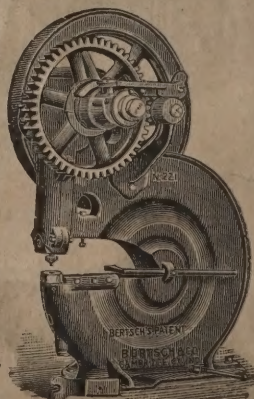
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